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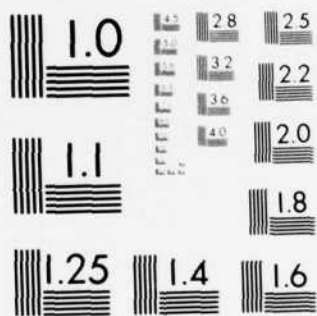
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THE EFFECTS OF JOB DESIGN CHARACTERIS-
TICS, STRESS, AND NEED FOR ACHIEVE-
MENT ON THREE EMPLOYEE
OUTCOME VARIABLES

Captain Michael K. Deacy, USAF
Captain Hal E. Marsh, USAF

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This research examined the relationship between job characteristics, stress, and need for achievement (n Ach) with each of three employee outcome variables: perceived job performance, job satisfaction, and job involvement. In addition, the unique contribution of each of the independent variables in predicting the three outcome variables was determined through linear regression analysis. Moderated regression was performed to determine the moderating effect of n Ach on each job characteristics/employee outcome relationship. Data were obtained from 691 employees at a large DOD installation. Results indicated that the full model, including job characteristics, stress, and n Ach significantly ($p < .001$) predicted perceived performance, satisfaction, and involvement. In every case, for each outcome variable, a unique set of significant predictor variables was identified. No evidence was found to support the notion that n Ach moderates job characteristics/employee outcome relationships. Results are discussed with regard to the future of job design research and the value of considering moderator variables in this context.

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THE EFFECTS OF JOB DESIGN CHARACTERISTICS,
STRESS, AND NEED FOR ACHIEVEMENT ON
THREE EMPLOYEE OUTCOME VARIABLES

A Thesis

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Logistics Management

By

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September 1983

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This thesis, written by

Captain Michael K. Deacy


and

Captain Hal E. Marsh

has been accepted by the undersigned on behalf of the
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CHAPTER I

INTRODUCTION

Background

The complexity of our industrialized society has induced managers of today to become more concerned with their resources, particularly their human resources. During these times of spiralling costs, austere budgets, and economic instability, managers look for alternatives to their current methods of management to yield cost savings and/or increases in production. These issues are not necessarily new. In fact, several theories were proposed at the turn of the century that focused on the efficiencies of individual worker performance (such as Frederick Taylor's scientific management approach, 1911). However, the beliefs of today hold that the employee is more valuable in and of himself than was popularly thought in earlier times. According to one author, economic benefits due to the present high productive efficiency of organizations contribute to "the affluence, education, and personal level of aspiration of individuals in American society" (Hackman, 1978, p. 405). Hackman states that, consequently, these individuals generally wish to work in more meaningful and challenging jobs and are often not willing to accept the monotony of a job tailored for maximum efficiency according

to the principles of scientific management. This, in addition to the increases in high technology and automation, has added a new dimension to the issues facing managers of today; cutting costs, and/or increasing production, yet maintaining a high quality of work life within the organization for their employees.

Job design has been an area of interest for managers and organizational researchers for several years as a possible method of increasing production, employee satisfaction, and loyalty. Consequently, a great deal of research has been conducted to determine what variables affect and influence the worker. Job performance, job satisfaction, and job involvement (degree of importance of one's work to oneself) are three common outcome variables used in determining the effect of job variables on the worker. Performance is conceived of as a behavioral outcome related to the job, whereas satisfaction and involvement are more commonly considered affective outcomes (those relating to emotional perceptions). Typical research hypotheses state that the presence of various independent task design variables allows one to predict the degree to which such behavioral and affective outcomes will be observed. In addition, different individuals are believed to react in different ways when subjected to the same conditions. This phenomenon has led researchers to postulate that individual differences variables might moderate or differentially affect predictor-outcome

relationships. Thus, to more accurately predict behavioral and affective outcomes, one must determine which individual differences are significant and in what way they modify responses to those variables common to all employees of a sample.

Problem Statement and Research Objectives

The job characteristics model developed by Hackman and Oldham (1975) delineates the motivating potential of a job with respect to its core dimensions of skill variety, task identity, task significance, autonomy, and feedback. These variables are measured by the authors' Job Diagnostic Survey (JDS) and are termed JDS variables. The authors developed the JDS as a means of diagnosing existing jobs in terms of the core dimensions and for evaluating the effects of job redesign on employees. Thus, one can measure changes in job performance, satisfaction, and involvement and correlate these changes to the change in amount of core dimensions present before and after job redesign. The JDS is currently a widely accepted measure of perceived job characteristics. Job stress, defined as the degree to which the worker feels he/she experiences stress and anxiety due to the job and job environment, has recently received a great deal of attention with regard to its effect on the worker, but there is yet no widely accepted theory as to how stress reactions are manifested in the work environment. No research has been published

to date in which stress and the JDS variables are examined jointly to determine absolute and relative effects in predicting behavioral and affective outcomes. In addition, although a number of empirical studies with the job characteristics model exist, the moderating effects of individual differences have not been thoroughly explored. Individual need for achievement, as measured by Steers and Braunstein (1976), is a possible moderator of the effects of the core job dimensions and stress on outcome variables. The present research attempts to determine the potential moderating effects of need for achievement with job characteristics and stress for the prediction of job performance, job satisfaction, and job involvement.

The research objectives of this thesis are to:

1. Determine the predictability of a model of job performance involving the main effects of job characteristics, stress, and need for achievement.
2. Determine the unique contribution of each of the main effect independent variables (job characteristics, stress, need for achievement) in predicting job performance.
3. Determine the contribution of the interactive effects of need for achievement with the main effect variables in predicting job performance with the job characteristics, stress, and need for achievement already in the equation.

4. Determine the predictability of a model of job satisfaction involving the main effects of job characteristics, stress, and need for achievement.

5. Determine the unique contribution of each of the main effect independent variables (job characteristics, stress, need for achievement) in predicting job satisfaction.

6. Determine the contribution of the interactive effects of need for achievement with the main effect variables in predicting job satisfaction with the job characteristics, stress, and need for achievement already in the equation.

7. Determine the predictability of a model of job involvement involving the main effects of job characteristics, stress, and need for achievement.

8. Determine the unique contribution of each of the main effect independent variables (job characteristics, stress, need for achievement) in predicting job involvement.

9. Determine the contribution of the interactive effects of need for achievement with the main effect variables in predicting job involvement with the job characteristics, stress, and need for achievement already in the equation.

Justification for the Research

The outcome variables observed in this study (job performance, job satisfaction, and job involvement) are present in and of interest to essentially all organizations. Thus, an understanding of the relationships existing between the

predictor variables (job characteristics, stress, and need for achievement) and these outcome variables would potentially yield benefits across a wide range of institutions.

Although many empirical studies have examined the effect of the job characteristic variables on job performance and job satisfaction, no studies to date have included stress and need for achievement together as additional predictor variables.

Assumptions and Limitations

The job characteristic variables (skill variety, task identity, task significance, autonomy, and feedback), originally developed to describe the core dimensions of jobs in general, are considered to be operative in all jobs. Research conducted in job design over the past several years has shown that each of these characteristics is present and measurable in jobs in many types of organizations and at all hierarchical levels. Stress as well, although measured in a multitude of forms and variations, is found to be present to some degree in all task settings. The individual difference variable, need for achievement, is viewed by researchers (Albanese, 1981; Steers & Braunstein, 1976) to be a motive present to some extent in all people. However, the constraints of organizational realities force one to limit the target population and generalizability of an individual study. To eventually accumulate a consistent, cumulative body of

knowledge concerning the relationships observed in this project, as in any field study, numerous future replications must be conducted both to confirm results contained herein and to observe these relationships in other organizations. Only then can one generalize conclusions to the larger population of all organizations.

CHAPTER II

LITERATURE REVIEW

The purpose of this literature review is to examine job design research with respect to the main effect of the job characteristics variables and stress and the moderating effect of individual differences on three dependent variables: job performance, job satisfaction, and job involvement. A great deal of research has been conducted in job design since the work of Turner and Lawrence (1965) and the development of the Job Diagnostic Survey (JDS) (Hackman & Oldham, 1975). The potential use of the JDS for diagnosing and redesigning jobs to improve employee performance has been of interest to managers since its development. Job stress has also been the focus of a great deal of interest in the past several years, particularly with regard to its effect on work performance and job satisfaction (Beehr & Newman, 1978; Parkington & Schneider, 1979; Sarason & Johnson, 1979). While several studies have shown relationships between the JDS and job stress variables and behavioral and affective outcomes, many researchers believe individual differences exert an important moderating effect on such relationships (O'Connor, Rudolf, & Peters, 1980; Oldham, Hackman, & Pearce, 1976; Steers & Spencer, 1977). Each of these areas of research has the potential to aid

managers in increasing organizational effectiveness by more effective management of human resources. An integrative conceptualization of how these variables might impact on affective and perceptual outcomes should aid in understanding some of the complex dynamics in the work situation.

Task Characteristics

The study of task design is a fairly recent phenomenon. Turner and Lawrence (1965) first classified and developed a quantitative measure of task attributes of jobs in widely differing technologies and types of work in an effort to determine worker response to such attributes. They stated that many contemporary writers assumed that as the work atmosphere becomes one of more advanced technology, that most workers must reconcile themselves to dull, monotonous jobs and look to their leisure activities for satisfaction and fulfillment. In focusing on worker response to technologically determined changes in job nature, these authors tested this assumption. In addition, Turner and Lawrence believed that as technology more rapidly advances, jobs must be more frequently redesigned and, thus, it is important to understand how workers respond to technologically determined changes in task attributes. Finally, these authors noted that apparent contradictions between research studies might be explained through the consideration of job characteristics. For example, the authors mention that "close supervision"

appeared to be more resented by workers having complex jobs as opposed to those with more simple jobs (Turner & Lawrence, 1965). This finding could well be explained in terms of characteristics of the jobs.

In an attempt to cover the range of technologies and many types of work, Turner and Lawrence (1965) obtained data from 47 jobs in 11 companies in different industries. The dependent variables utilized in the study were attendance (measured by the number of times absent), job satisfaction (measured by five questions), and psychosomatic response. Psychosomatic response was defined as "a measure of freedom from nervousness or nervous disorders the worker experienced and related to his job" (Turner & Lawrence, 1965, p. 12). Measure of psychosomatic response was not used to any large extent in the study because preliminary analysis raised substantial doubt as to its validity. The researchers drawing on a review of relevant literature and their own past experiences compiled a list of task attributes which might be expected to influence worker response.

After analysis of these attributes, the researchers chose six Requisite Task Attributes: variety, autonomy, required interaction, optional interaction, knowledge and skill, and responsibility. Variety referred to the range of different activities which were prescribed by the nature of the task, and was measured as a combination of two factors: motor variety (variety of movements) and object variety

(number of objects and tools used). Autonomy is a measure of the discretion expected of the worker in performing a task activity. Required interaction refers to the amount of interdependence required to properly perform a job task, especially face-to-face interaction. Optional interaction is a measure of nonrequired interaction which may take place despite restraints which are technologically determined such as noise of machinery hindering communication between workers. Knowledge and Skill is measured as the amount of time required for a person to learn how to accomplish the job task proficiently. Responsibility, a combination of the measures of probability of serious error, ambiguity of remedial action, and time span of discretion, is a measure of a worker's mental state regarding a "responsible attitude" for the proper performance of a task. Six Associated Task Attributes (task identity, pay, worker conditions, cycle time, level of mechanization, and capital investment) were also measured and considered as closely associated to the nature of the job although not required in its performance. The data collection instrument used in this research was the Requisite Task Attribute Index (RTA Index). It was used in field scoring each of the 47 jobs on the requisite task attributes by one or more researchers.

Strong intercorrelations were observed in the scores of the attributes, ranging from a mean correlation of .57 between motor variety with all other requisite attributes, to

.43 for optional interaction off-the-job. The attribute scores were combined (double weighting autonomy and variety, as especially significant in the judgment of the researchers) into an overall Requisite Task Attribute Index which gives an overall measure of job complexity. The 47 jobs in the study were then rank ordered by RTA Index. The Chi Square test of significance was used in data analysis to determine the strength of relationships between variables. Turner and Lawrence (1965) found as hypothesized that high levels of attendance were positively correlated with high RTA Index jobs. However, they did not find the same support for their hypothesized correlation of high RTA Index with job satisfaction. It was determined that higher satisfaction was correlated with high RTA Index jobs for the subpopulation of Town workers and a negative correlation was present for the City group. Thus, it appears that workers in a more rural area are more likely to prefer complex jobs than workers from an urban area. Turner and Lawrence hypothesized that urban workers, coming from a large, heterogeneous population, might not have developed the norms and values which tend to increase the attractiveness of more complex and skilled jobs.

Perceived task attributes scores, measured by the Perceived Task Index (a perceptual instrument completed by the workers) correlated positively between requisite task attribute scores and job satisfaction for the whole population, although a higher correlation for the Town subpopulation

was found. The correlation between perceived task attributes and satisfaction suggested that a worker's perception of a task attribute is a useful indicator of job satisfaction. Turner and Lawrence (1965) noted that in future studies researchers might use relatively unstructured interviews to even better determine what the workers' perceptions are.

Hackman and Lawler (1971) extended the research of Turner and Lawrence (1965) by interpreting the importance of job characteristics in terms of the expectancy theory of motivation. Citing the moderating effect of urban versus rural background of subjects in the Turner and Lawrence study, Hackman and Lawler suggested that individual differences such as need for satisfaction of higher order needs might be a better choice of a moderating variable. Hackman and Lawler deduced that in accordance with the expectancy theory of motivation, a job will foster internal motivation if the worker feels responsible for a whole, identifiable piece of work, the work outcomes are perceived as intrinsically meaningful or worthwhile, and feedback is provided concerning the worker's performance (Hackman & Lawler, 1971).

The authors hypothesized that characteristics of the job may cause high satisfaction and high effort (which should be linked to high performance), especially when employees desire higher order need satisfaction and perceive their degree of effort on the job as directly related to this satisfaction. Using four of the requisite task attributes

developed by Turner and Lawrence (1965) (autonomy, task identity, variety, and feedback), Hackman and Lawler proposed to measure the job characteristics described above. Specifically, autonomy was perceived as a measure of the worker's feeling of responsibility for an identifiable piece of work. Task identity and variety were perceived as indicators of the worker's experienced meaningfulness of the work. Finally, feedback provided information to the worker on his performance. The authors stressed that the worker's perception of these job characteristics affect attitudes and behavior rather than an objective measure of the characteristics. Thus, Hackman and Lawler assumed that individuals seeking higher need satisfaction would experience satisfaction through performing well on jobs perceived as high in the above job dimensions.

Hackman and Lawler collected data from 208 employees and 62 supervisors working in 13 jobs in the plant and traffic department of an eastern telephone company. Data on the independent variables were collected from four sources: a set of objective measures derived from Turner and Lawrence (1965), questionnaires completed by first- and second-level management, observation and interview of employees by researchers, and questionnaire completion by the employees. Data were collected on variety, autonomy, task identity, feedback, dealing with others, and friendship opportunities. Dealing with others and friendship opportunities were adapted from Turner and Lawrence's (1965) measures of required

interaction and optional interaction, and were included only as supplementary measures of job design. No predictions were made concerning these two variables. Correlations between the four sources of measurement of the six job dimensions were quite high, with the exception of feedback. There was no appreciable agreement between the sources on the level of feedback present in jobs. Because of the correlation of employee judgments with other measures of the job dimensions, Hackman and Lawler depended mainly on employee ratings in analyzing their results. A questionnaire was also administered to measure the degree to which workers desired higher order need satisfaction from their work.

Dependent variable measures obtained by questionnaires from the employees were experienced work motivation, job involvement, general job satisfaction, and specific satisfaction with aspects of their jobs. Performance as a dependent variable was rated by supervisors in terms of quantity of work, quality of work, and overall effectiveness of work. Finally, the number of occasions absent over 12 months was determined from company payroll records as the measure of absenteeism. Occasions of absence were used rather than days of absence in order to avoid overemphasis of a single long period of absence.

Analysis of results was conducted in terms of correlations between each of the job characteristic measures and the dependent variable measures. As expected, high measures of

the four core dimension measures (variety, autonomy, task identity, and feedback) were, in general, positively related to measures of motivation, satisfaction, performance, job involvement, and attendance. Support was obtained for the hypothesis that subjects with high higher order need strength would respond more favorably to jobs high in the core dimensions than those subjects with lower scores. However, this moderating effect was not present with respect to task identity.

Hackman and Oldham (1975) recognized that many American organizations were attempting to use job redesign to increase productivity and decrease employee alienation from their jobs. Job enrichment, a technique of adding vertical depth to jobs in an effort to increase worker motivation, was apparently the facet of job redesign of most interest to managers. However, little success was realized in determining how effective job design is in improving employee behavior and attitudes such as job performance, satisfaction, and involvement. Hackman and Oldham hypothesized that one reason for this scarcity of knowledge was that no psychometrically sound measure existed to determine what job redesign actually does. Building on previous research (Hackman & Lawler, 1971; Turner & Lawrence, 1965), Hackman and Oldham developed the Job Diagnostic Survey as an instrument to measure the effect of "core" job dimensions on employee outcomes (internal motivation, satisfaction, performance, absenteeism, and

turnover) through the intervening variables of experienced meaningfulness of the work, experienced responsibility for work outcomes, and knowledge of results of work activities. These intervening variables were termed "critical psychological states" created by the presence of five core job characteristics (skill variety, task identity, task significance, autonomy, and feedback). Hackman and Oldham posited that when all three of these states were present, they produced varying degrees of positive job and personal outcomes such as performance, satisfaction, and involvement.

Skill variety, task identity, and task significance were thought to increase experienced meaningfulness of the work. High autonomy was thought to increase experienced responsibility for work outcomes, and high levels of feedback were expected to increase knowledge of results of work activities. The authors developed a multiplicative model to summarize the effect of the presence of each of the core characteristics and reflect the "motivating potential" of a job. The formula is:

$$\text{Motivating Potential Score (MPS)} = \left[\frac{\text{Skill Variety} + \text{Task Identity} + \text{Task Significance}}{3} \right] \times (\text{Autonomy}) \times (\text{Feedback})$$

Hackman and Oldham theorized that individuals react differently to jobs high in motivating potential, depending on the degree to which they "strongly value and desire

personal feelings of accomplishment and growth" (p. 160). Those who do strongly value and desire such feelings would react very positively to jobs high in the core dimensions and, conversely, those who do not strongly value and desire such feelings would not react so positively. Thus, employee growth need strength, an individual difference characteristic indicating to what degree employees did value and desire feelings of accomplishment and growth, was predicted to moderate the relationships between core job dimensions and the critical psychological states and between the critical psychological states and personal and work outcomes.

Developing the JDS from the research instruments developed by Turner and Lawrence (1965) and Hackman and Lawler (1971), definitions of the core job dimensions were as follows:

Skill variety. The degree to which a job requires a variety of different activities in carrying out the work, which involve the use of a number of different skills and talents of the employee.

Task identity. The degree to which the job requires completion of a "whole" and identifiable piece of work that is, doing a job from beginning to end with a visible outcome.

Task significance. The degree to which the job has a substantial impact on the lives or work of other people whether in the immediate organization or in the external environment.

Autonomy. The degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used in carrying it out.

Feedback from the job itself. The degree to which carrying out the work activities required by the job results in the employee obtaining direct

and clear information about the effectiveness of his or her performance. (Hackman & Oldham, 1975, pp. 161-162)

The JDS also measures two supplementary job dimensions: feedback from agents (agents such as supervisors and co-workers) and dealing with others (degree to which the job requires working closely with others).

The psychological states acting as mediators between the job dimensions and job outcomes are defined as:

Experienced meaningfulness of the work. The degree to which the employee experiences the job as one which is generally meaningful, valuable, and worthwhile.

Experienced responsibility for work outcomes. The degree to which the employee feels personally accountable and responsible for the results of the work he or she does.

Knowledge of results. The degree to which the employee knows and understands, on a continuous basis, how effectively he or she is performing the job. (Hackman & Oldham, 1975, p. 162)

The JDS also measures several affective job responses: general satisfaction, an overall measure of the worker's job satisfaction; internal work motivation, the extent to which the worker is internally motivated to perform well; and various specific satisfactions with job security, compensation, other workers, supervision, and opportunities at work for personal growth and development.

The final measure obtained by the JDS is individual growth need strength. This individual characteristic, viewed as the degree to which the worker desires "growth"

satisfactions from job tasks, was predicted to affect how positively workers respond to jobs scored high in motivating potential.

Hackman and Oldham obtained data from 658 employees from seven organizations in 62 different jobs. Data on each of the variables, except the specific satisfaction measures, were measured in two different question formats in an effort to reduce confounding of substantive content and measurement technique internal to the JDS. Response categories to the JDS items were on a seven-point Likert scale. Internal consistency reliabilities ranged from .56 for the social satisfaction measure to .88 for a measure of growth need strength. For the core job dimensions, the internal consistency reliabilities were .59 for task identity, .66 for task significance and autonomy, and .71 for skill variety and feedback from the job itself. Moderate positive intercorrelation was obtained between the job dimensions, ranging from .16 (skill variety-task identity) to .51 (skill variety-autonomy). This was expected because jobs that are perceived as "good" overall are often perceived as good in several respects, whereas jobs perceived as "bad" are likewise perceived as bad in several respects. Hackman and Oldham stated that this lack of complete independence does not invalidate the usefulness of these variables as job dimensions as long as their intercorrelation is considered in examining job designs based on these dimensions.

As predicted by Hackman and Oldham, the core job dimensions correlated positively with the measures of satisfaction and motivation. Additionally, the three critical psychological states positively correlated with those job dimensions associated with them previously. That is, skill variety, task identity, and task significance were correlated with experienced meaningfulness of the work. Autonomy was correlated with experienced responsibility for work outcomes, and feedback was correlated with increased knowledge of results. The motivating potential score was positively correlated with performance ratings and negatively correlated with absenteeism. Finally, support was obtained for the hypothesis that individuals higher in growth need strength react more positively to levels of the job dimensions present than those individuals with lower growth need strength.

White and Mitchell (1979) compared the relative effects of job enrichment and social cues on job satisfaction and work performance. Data were obtained and analyzed for 41 undergraduate business students who thought they had been hired to compile information on the stock market. The students were paid to look up and record closing prices, calculate and record percentage price changes per week, and graph the weekly price changes on graph paper. Two naive students worked along with a research confederate in each work group. The researchers manipulated job enrichment through verbal instructions and task procedures designed to influence

perceptions of the five JDS variables. The confederates established positive and negative social cues through their behavior and verbal comments while work was being performed.

The two independent variables were level of job enrichment (enriched or unenriched) and orientation of social cues (positive or negative). Level of job enrichment was measured by administration of the JDS to a separate control group of 18 subjects (nine under enriched conditions, nine under unenriched conditions) who performed the job tasks in the absence of social cues manipulation. Social cue orientation was measured by eight questionnaire items intermixed with items dealing with other variable measures. Responses were obtained on a seven-point Likert scale.

The dependent variables measured were employee perception of job characteristics, job satisfaction, and productivity. Measurements of perceived job characteristics were obtained on the five core job dimensions of the JDS developed by Hackman and Oldham (1975) and on job ambiguity as measured on a six-item scale developed by Rizzo, House, and Lirtzman (1970). Job satisfaction was computed as the average of three responses to general job satisfaction items taken from the JDS instrument (Hackman & Oldham, 1975). Productivity was measured for each employee by dividing the number of items produced (compiled, computed, and graphed) by the total time worked, resulting in an item per minute output measure for each.

Analysis of variance was used to compare the effects of task conditions (enriched versus unenriched) and type of social cues (positive versus negative) on the dependent variables. Task condition significantly affected task identity, task significance, and autonomy. Type of social cues had a significant effect on skill variety. Neither independent variable had a significant main effect on either feedback or job ambiguity although their interaction effects (Task X Cues) were significant for both measures. The main effect of type of social cues was significant for both job satisfaction and productivity. However, task condition and the task/cues interaction had no significant effect. Employee perceptions of job enrichment appear to be more strongly related to the job itself than to social cues provided by co-workers. However, satisfaction and productivity were found to be affected significantly by social cues and unaffected by job enrichment. White and Mitchell (1979) concluded that social cues appear to be an important factor in improving motivation and productivity and should be included with job characteristics in organizational behavior theory.

Several researchers (Dunham, 1976; Dunham, Aldag, & Brief, 1977; Sims, Szilagyi, & Keller, 1976) have investigated possible weaknesses in the dimensionality of the JDS instrument. Dunham (1976) and Dunham et al. (1977) have discovered that its dimensionality has varied over different

samples. Dunham (1976) collected data on 3,610 employees of a large merchandising company. The JDS was administered by company personnel to obtain measurements of the five core job characteristics developed by Hackman and Oldham (1975). A measure of job satisfaction was obtained as a criterion reference for the JDS on 784 of the employees (Smith, 1969). Through factor analysis, Dunham determined that the feedback and task identity items load on distinct single factors and that two of the three task significance items do so. However, the items proposed to measure task variety and autonomy cover two factors together. Because of this, regression analysis was performed on the 784 subject subsample mentioned above to determine a method of reducing the five JDS scales to four, more distinct scales for predicting job satisfaction. The resulting model did not add to the predictiveness of the five-factor model. Dunham (1976) concluded that the dimensionality and theory of job characteristics was still unclear in that a unidimensional model or a model combining elements gave results comparable to the JDS model.

Dunham et al. (1977) collected data from 5,945 employees of five different organizations, approximately 20% of whom were included in the Dunham (1976) study. The subjects responded to the 15 JDS items measuring the core job characteristics. The respondents were divided into 20 subsamples by type of job. For each subsample and the combined sample,

a five-, four-, three-, and two-factor solution was examined to determine the "most interpretable" solution. Seven subsamples were most interpretable with a five-factor solution, six with four factors, five with three factors, and two with two factors. Only two of the seven five-factor solutions matched the original structure proposed by Hackman and Oldham (1975). For all of the factors examined, the original factors were confirmed 39% of the time by all three of the JDS items comprising each JDS core dimension. Thus, Dunham et al. concluded that the underlying dimensionality of the JDS factors varies across samples and must be empirically examined for use with each individual sample.

Sims et al. (1976) developed another perceptual, job characteristics instrument, the Job Characteristic Inventory (JCI). Many items were taken from the Hackman and Lawler (1971) instrument discussed earlier. In addition, items were added to each scale in an effort to improve reliability of the instrument. The scales were variety, autonomy, task identity, feedback, dealing with others, and friendship opportunities. Because previous research has concentrated on predominantly male populations in business and industrial settings, this study examined two samples: one predominantly female in a medical center and one exclusively male in a manufacturing firm. The 723 subject medical center sample showed reliabilities of job characteristics scores ranging

from .62 for friendship to .80 for variety and for feedback. The 192 subject manufacturing firm sample had reliabilities ranging from .72 for dealing with others to .86 for feedback. In both samples, discriminant validity of the job characteristic measurements, as indicated by analysis of variance and multiple discriminant analysis, was judged sufficient for use in job characteristics research in relation to behavioral and affective outcomes.

Pierce and Dunham (1978) compared the JDS with the JCI, collecting data on 155 insurance company employees with regard to the four job dimensions common to both instruments (variety, autonomy, identity, and feedback). The internal consistency reliabilities of each of the measurement scales was examined with the Cronbach's coefficient alpha. In this sample, the coefficient alpha values ranged from .69 for feedback to .79 for autonomy on the JDS instrument. The values for the JCI scales ranged from .85 for autonomy to .90 for the feedback and variety measures. Factor analysis was employed to compare the empirical dimensionality to the a priori dimensionality for each of the instruments. The dimensionality of the JDS was not well confirmed. Only one factor (identity) was loaded on by all three measurement items for each core dimension of the instrument. However, all four of the JCI dimensions were confirmed. Pierce and Dunham (1978) state that the above results suggest that the

dimensionality of the JDS may be sample dependent, but also cautioned that these results are based on one relatively small sample and that replication is needed. The authors suggest that multiple methods of measurement is the optimal approach for measuring job characteristics and note that "the utility of the JDS in job design research has been clearly demonstrated" (Pierce & Dunham, 1978, p. 128).

Pierce and Dunham (1976) found that the JDS is "the latest and most complete refinement of an instrument" (p. 92) for measuring task characteristics, and note it is the instrument most used for perceptual measurement of task design. Dunham et al. (1977) concur in stating that the JDS is "probably the most complete and widely used instrument to measure perceived task design" (p. 210). As of this writing, no instrument has replaced the JDS in this usage. Because so much of the research has been done with the JDS and because of its demonstrated utility, in order to establish continuity, further research should be conducted with this instrument.

Research conducted on the relationship between task characteristics and employee outcomes has generally demonstrated some positive relationship. Job enrichment, in most studies, appears to demonstrate a greater impact on affective outcomes such as satisfaction than on behavioral outcomes such as performance. Both the JDS (Hackman & Oldham, 1975)

and the JCI (Sims et al., 1976) are acceptable measurement instruments for use in job design research in relation to affective and behavioral outcomes. Future research, including other variables in combination with job characteristics in their effect on employee outcomes, would appear to be justified.

Stress

Job stress is a topic which has generated a great deal of interest in the popular literature in recent years, but there is not a great deal of published literature which relates job stress to performance, satisfaction, and involvement. Beehr and Newman (1978) found that there is a lack of agreement among studies on a definition of stress. They noted that several studies included job-related and non-job-related stress factors together although they represent entirely different elements of stress. Brief, Schuler, and Sell (1981, pp. 53-54) state that stress is sometimes viewed as inversely related to the degree of job characteristics present and is often indicated by decreasing levels of job involvement and job satisfaction. However, they also state that opportunity stress (such as opportunity for promotion) may have a positive effect on involvement and satisfaction, while stress due to additional demands and constraints would have a negative effect. In summary, these authors conclude

that a great deal of research remains to be done to clearly determine the effects of stress on employee outcomes.

Sarason and Johnson (1979) conceptualized both life stress and job stress as a function of the amount of change encountered by the employee. Measures were obtained from a sample of 44 male Navy personnel for each type of stress and for job satisfaction. Stress was considered positive or negative depending on whether the employee considered the stressful event as desirable or undesirable, respectively. Job satisfaction was measured in terms of satisfaction with the work itself, one's supervisor, people worked with, pay, and opportunity for promotion. Research results supported the authors' prediction that positive stress would correlate with increased job satisfaction while negative stress would correlate with decreased satisfaction. Similar research by Gupta and Beehr (1979) examined the relationship between job stress and two employee withdrawal behaviors (absenteeism and turnover) often associated with low job satisfaction. Data were obtained on 651 workers in five midwestern organizations. Four measures of undesirable types of job stress were obtained. Role ambiguity described the degree to which the worker knew what was expected of him. Role overload related to the amount of time the worker had to complete job tasks. Resource adequacy described the sufficiency of tools and equipment required to do a job. Underutilization of skills

was represented by the worker's perception that the skills learned both through past experience and through formal education were required in the job. Absenteeism was measured as occasions absent during a two-month work period. Two measures of turnover were obtained. Turnover intent was the workers' intent to actively seek a new job within one year of the interview. Actual turnover was obtained from organizational records covering the 18 months following the interviews and included only voluntary turnover. Research results supported the positive correlations of undesirable types of stress with absenteeism and the measure of turnover intent. Negative stress was less strongly correlated with actual turnover.

Parkington and Schneider (1979) measured role stress as evidenced by role ambiguity and conflict in order to determine a causal relationship with employee outcomes of organizational dissatisfaction, frustration, perceived poor customer service, and turnover intentions. Data concerning role stress and employee outcomes were obtained on 263 bank branch employees at 23 branches of a commercial bank. In addition, data on customer attitudes were obtained on 1,655 customers. The authors found that role stress was related to the degree of discrepancy between employee and employer attitudes. For instance, when employees perceived the employers as more bureaucratic than themselves, they

experienced more job stress. A positive relationship was observed between role stress and higher levels of negative employee outcomes. Customer attitudes concerning perceived service quality were significantly related to two positive employee outcomes: organizational satisfaction and service quality views. No significant correlation was observed between customer attitudes and frustration or with turnover intentions.

Research conducted on the relationship of stress to employee outcomes has been limited and ambiguous in meaning. Although it appears stress is related in some way to such outcomes, a great deal of further research is necessary to determine these relationships.

Moderating Variables

While considerable research has indicated that job characteristics are related to positive behavioral and affective employee outcomes, it is often thought that different individuals are affected to different degrees. However, there is not a great deal of information available which clearly demonstrates why these differences exist with respect to job redesign research. Hulin and Blood (1968) reviewed the literature relating job enlargement to job satisfaction and employee behavior, concluding that expanding jobs to improve employee attitudes and behavior is only applicable to certain types of workers. The Protestant work

ethic involves the belief that one should work hard to get ahead and one is responsible for one's own destiny. Hulin and Blood (1968) believe that those workers that come from the American middle class are instilled with a strong sense of the Protestant work ethic and would react positively to job enlargement. However, they point out that workers brought up in lower-class, urban areas may reject middle-class norms and the Protestant work ethic. These workers would presumably not behave and feel as do their middle-class counterparts.

Griffin, Welsh, and Moorhead (1981) reviewed 13 studies relating task characteristics to job performance, finding inconsistent results concerning moderator variables. One problem noted was that no two studies measured performance in exactly the same way and some of the performance measures used were potentially invalid. Few of the individual differences observed in the studies reviewed by Griffin et al. significantly moderated the relationship between task characteristics and employee performance. Several of these articles are discussed below.

Hackman and Lawler (1971) collected data on 208 telephone company employees working in 13 different jobs in separate locations. In addition, data were obtained from 62 supervisors of these employees. Measures of variety, autonomy, task identity, feedback, dealing with others, and

friendship opportunities were obtained as in the Turner and Lawrence (1965) study. In addition, a measure of individual need strength (concerning the desire of subjects to obtain higher order need satisfactions from their jobs) was obtained from the employees on a 12-item questionnaire. Dependent variables, also obtained by questionnaire, were experienced work motivation, job involvement, general job satisfaction, and specific satisfaction items. Employee performance measures were obtained by supervisor appraisal in terms of quantity, quality, and overall performance effectiveness. Absenteeism was measured as the number of occasions absent over the 12-month period of the study. Hackman and Lawler (1971) found that the four core job dimensions (variety, autonomy, task identity, and feedback) were positively related to motivation, job involvement, general job satisfaction, and nearly all of the specific satisfaction measures. The core dimensions also showed a weak positive relationship to nearly all of the supervisors' ratings of performance measures. Autonomy, task identity, and feedback were negatively related to absenteeism. Hackman and Lawler (1971) compared those employees scoring in the top one-third on individual need strength with those scoring in the bottom one-third in order to determine the moderating effect of this variable on the relationship of the core characteristics to the dependent variables measured. Subjects with high individual need

strength showed a stronger relationship between the core dimensions of variety, autonomy, and feedback and the dependent variables. However, individual need strength did not appear to moderate the relationship between task identity and the dependent variables. The product score of the core dimensions (variety X autonomy X task identity X feedback) was then correlated with the dependent variables for those subjects scoring in the top and bottom one-thirds on individual need strength. Again, evidence of moderation was observed. The authors concluded that individual need strength acts as a moderator in determining the effect of the core dimensions on employee outcomes.

Wanous (1974) examined three individual differences as moderators of effects of job characteristics on employee outcomes: urban versus rural background, belief in the Protestant work ethic, and individual need strength. Data were obtained on 80 female telephone operators in an eastern telephone company. Subjects who grew up in a city with a population over 10,000 were classified as urban, the others as rural. Measurements of the subjects' belief in the Protestant work ethic and their individual need strength were obtained by questionnaire. The subjects were split at the median score and ranked as high or low in these two variables. Subjects described their jobs in terms of the presence of the four core dimensions (variety, autonomy, task identity, and feedback) developed by Hackman and Lawler (1971). Three

dependent variables, satisfaction with specific job characteristics, overall job satisfaction, and job behavior (performance and absenteeism), were obtained. Individual need strength was the moderator most strongly correlated to satisfaction with specific job characteristics, followed by the Protestant work ethic, and finally by the urban/rural distinction. The correlations between the core job characteristics and overall satisfaction displayed a similar pattern. In examining the moderators' effects on the relationship between the core characteristics and job behavior, Wanous (1974) reported that there was essentially no difference in the effectiveness of the three variables and that all three were relatively ineffective in moderating the above relationship. Thus, of the three individual differences considered in this study, individual need strength appears to be the most effective in moderating the relationship between job characteristics and job satisfaction, while none of the three display any significant superiority in relation to job performance. However, because of the all-female, small sample (80 subjects), much replication is needed before generalization of these results can be made.

Hackman and Oldham (1976) collected data on 658 employees in 62 jobs from seven business organizations. Individual growth need strength (GNS), a type of individual need strength, was the moderator variable considered. The

JDS instrument was used to collect data on job characteristics, and the "job choice" section was used to measure growth need strength. Performance measures were obtained from supervisors with respect to effort expended on the job, quality of work, and quantity of work. In addition, absence data were recorded as the number of days employees had been absent in the preceding year's period.

Hackman and Oldham (1976) predicted that individuals scoring high in GNS would have a stronger relationship between the three psychological states of the job characteristics model (Hackman & Oldham, 1975) and the outcome variables, as well as a stronger relationship between the core characteristics and their respective psychological states than those individuals scoring low in GNS. Subjects scoring in the top one-quarter of the sample on GNS were compared to those in the bottom one-quarter with respect to this prediction. The product of the three psychological states was correlated with each outcome variable for the high- and low-GNS subjects. The high-GNS subjects did show stronger relationships, as predicted, in all cases. The magnitude of the differences in correlations were significant for the internal motivation, general satisfaction, growth satisfaction, and rated work effectiveness outcomes, although not significant with respect to the absenteeism measure. The relationships observed between core characteristics and their

respective psychological states were stronger for high-GNS subjects in each case and the differences were all significant with the exception of task identity. The authors noted that, although high-GNS subjects reacted more positively to jobs high in the core job characteristics than did low-GNS subjects, even the low-GNS subjects did react positively to more complex jobs. This observation indicates that low-GNS subjects do not appear to react negatively to enriched jobs as hypothesized by some researchers (Hulin and Blood, 1968). Hackman and Oldham (1976) note that this is especially significant in this sample because many subjects scored extremely low in GNS. They conclude that low-GNS subjects may react more positively if job enrichment is implemented slowly and carefully, but that negative results should not be expected.

Oldham, Hackman, and Pearce (1976) tested the moderating effects of GNS and level of satisfaction with the work context, separately and in conjunction, on the relationship between the Motivating Potential Score (MPS) and two employee outcomes, internal work motivation and performance. Data were obtained on 201 employees working in 25 different jobs at a large metropolitan bank. The JDS was employed to gather data from the employees while measures of performance, tenure, salary, and biographical data were obtained from the bank's records. The measure of satisfaction with the work

context related to satisfaction with pay, security, supervision, and social aspects of the work environment. One measure of performance was obtained through supervisor evaluation, while another was represented by salary corrected for tenure.

Oldham et al. (1976) compared those subjects scoring in the top one-quarter on GNS with those in the bottom one-quarter with respect to correlations between their MPS's and employee outcomes. The high-GNS subjects had greater positive correlations between MPS and employee outcomes than did the low-GNS subjects. The difference between correlations relating to salary corrected for tenure was significant. Employees were divided into two groups, scoring above and below the median on satisfaction with work context. The authors predicted that employees highly satisfied with job context would be more highly motivated and demonstrate higher performance on jobs with a high MPS than employees with lower levels of contextual satisfaction. Results of this study showed support for this prediction. The authors also observed that workers who were high in GNS and in level of contextual satisfaction displayed a significantly stronger relationship between MPS and performance measures than did workers with low scores on these variables. This effect was not significant with respect to the internal motivation measure. Oldham et al. (1976) concluded that prior to instituting job enrichment, one should determine the levels of

GNS and satisfaction with work context existing in the work force. If low levels of both exist, the employer may be well advised to take action to improve job context satisfactions before attempting to introduce job enrichment.

Three moderator variables were investigated by Sims and Szilagyi (1976) in a study of 766 paramedical and support workers at a large midwestern medical center. Self-actualization need strength represents the degree to which workers value higher level work outcomes such as doing high quality work and feelings of self-fulfillment. Locus of control represents the degree to which the worker feels his own actions determine events. An individual with an internal locus of control feels that his actions are responsible for events whereas one who feels fate is responsible is said to have an external locus of control. In addition to these individual differences, the moderating effect of occupational level was examined. The JCI was utilized to obtain measurements of job characteristics while the Job Descriptive Index developed by Smith, Kendall, and Hulin (1969) measured job satisfaction. Employee performance was evaluated by supervisory appraisal. Results indicated that employees with high self-actualization need strength displayed a stronger relationship between satisfaction measures and three job characteristics: variety, autonomy, and feedback than those employees with lower scores. Self-actualization need strength also moderated the autonomy

to performance and feedback to performance relationships in a similar manner. Employees with an external locus of control exhibited a stronger relationship between autonomy and satisfaction with supervision, autonomy and satisfaction with work, and dealing with others and satisfaction with work; whereas relationships including variety, task identity, feedback, performance, or friendship did not appear to be moderated by locus of control.

Occupational level appeared to moderate the job characteristic relationships observed. For employees working in the higher occupational level, in a relatively complex environment, feedback is positively related to satisfaction with both supervision and work, but employees at the lower level display a negative relationship between feedback and satisfaction with work. In addition, employees at the lower occupational level demonstrate a strong relationship between variety and satisfaction with work, while the higher level employees display no relationship between the two.

Sims et al. (1976) conclude that individual need strength appears to moderate the effects of job characteristics on employee outcomes much as pointed out previously by Hackman and Lawler (1971). In addition, Sims et al. state that occupational level also moderates such relationships while the moderating effect of locus of control remains unclear.

A study investigating the effects of goal setting and job enrichment, separately and in conjunction, on job performance

and satisfaction was conducted by Umstot, Bell, and Mitchell (1976). Subjects were hired as part-time employees to identify and code parcels of land with appropriate zoning codes for a local county government. Although the subjects were told that different ways of doing the work were being studied, they were unaware that a formal experiment was being conducted.

In phase 1 of the Umstot et al. (1976) study, data were obtained on 42 subjects working under four sets of conditions: 7 with enriched jobs and assigned goals, 10 with enriched jobs and no goals, 9 with unenriched jobs and assigned goals, and 16 with unenriched jobs and no goals. The task identity, skill variety, autonomy, task significance, feedback, and growth need strength measures from the JDS (Hackman & Oldham, 1975) were administered to subjects to measure job enrichment. Goal specificity and goal difficulty were measured by questionnaire and observation. Job satisfaction was measured with the Smith et al. (1969) Job Descriptive Index, while job performance was objectively recorded as the average hourly production rate for the second day of the study. In comparing those subjects scoring in the top one-third on GNS with those in the bottom one-third, no significant differences were observed between correlations of MPS and satisfaction or performance. However, correlations between variety, significance, feedback, and autonomy with satisfaction were significant for the high-GNS subjects, while variety

and identity exhibited significance for the low-GNS subjects. In short, Umstot et al. (1976) found that GNS showed some moderation of the MPS/satisfaction relationship although the difference between high- and low-GNS scorers was not significant. No appreciable effect was observed for the MPS/productivity relationship.

In phase 2 of the experiment, subjects in unenriched jobs received job enrichment and subjects without goals were provided with goals. Results indicated that addition of goals had a large impact on performance, but only a small effect on satisfaction, while job enrichment had a large effect on satisfaction, but only a minor effect on performance. The moderating effect of GNS was not considered in this phase of the experiment. Umstot et al. (1976) concluded that the combination of goal setting and job enrichment may be useful in improving both performance and satisfaction in the work force.

Orpen (1979) obtained data from 72 clerical employees of a large quasi-Federal agency in order to evaluate the effect of job enrichment on several employee outcomes. The effects of satisfaction with job context and GNS were also examined. The JDS was employed to obtain measures of the job characteristics perceived by the employees. Half of the subjects were assigned to enriched jobs, half to unenriched. Measures of contextual satisfaction and GNS were obtained by questionnaire as were the dependent variable measures of work

satisfaction, job involvement, and intrinsic motivation (JDS). Job performance was measured by supervisory ratings individually and by a group productivity index for the two subsamples. Turnover was calculated as the number of persons leaving the organization divided by the number of persons in the group at the beginning of the study. Absenteeism in each group was measured by dividing total normal working hours by the total number of hours absent. Employees were measured on all variables upon starting the study and again after six months of working in the two groups. Results, based on analysis of covariance, indicated that job enrichment significantly increased job satisfaction, job involvement, and intrinsic motivation.

In order to evaluate the moderating effect of GNS on the relationship between job characteristics and employee outcomes, subjects scoring in the top and bottom one-quarters on this variable were compared. By calculating correlations for each of the job characteristics and MPS with the employee outcomes of interest, Orpen (1979) found that GNS appears to moderate these relationships. In testing the effects of satisfaction with job context, the authors compared subjects scoring in the top and bottom one-quarters on this variable as well. Again, support was found for the contention that the relationships between job characteristics and employee outcomes were moderated. However, neither of the two

moderating variables were found to have an appreciable effect on the relationship between job characteristics and performance measures.

In a longitudinal study of the relationship between job characteristics and employee outcomes, Griffin (1981) examined the moderating effect of GNS over time. Data were obtained and analyzed for 107 employees of a large manufacturing plant. The data were obtained at the beginning and the end of a three-month period. Measures of job characteristics were obtained through the administration of the JCI while GNS was evaluated with the JDS. Satisfaction with the job and with supervision were measured with a separate questionnaire. Performance was measured as the average of the organization's productivity index over the five days before and five days after data collection for each employee. Results of this study indicate that employee perceptions of job characteristics are fairly stable over short time periods. However, individual reactions to perceived job characteristics may change substantially over even a short period of time. Griffin (1981) concludes that there is no significant relationship between job characteristics and performance, either within or across time points, at least in this sample. However, each of the job characteristics is significantly related to job satisfaction. The results of this study do not clearly demonstrate the moderating effect of GNS on the job characteristics/employee outcome relationships.

Pokorney, Gilmore, and Beehr (1980) obtained data on 102 first-level managers and 71 second-level managers in a large insurance company. The JDS was used to obtain data from the first-level supervisors and the Job Rating Form (JRF) (Hackman & Oldham, 1976) for second-level supervisors. Subgroup analysis and stepwise multiple regression were used to determine the moderating effect of GNS on the relationship between job characteristics and job satisfaction. The two methods of analysis resulted in inconsistent results. While subgroup analysis indicated strong support for the moderating effect of GNS, moderated regression analysis did not. Pokorney et al. (1980) noted that, as a group, their sample had relatively high GNS scores, more accurately describing high and moderate scores than high and low. Thus, division into arbitrary high- and low-level groups may have reduced the reliability of this study for determining the effect of GNS as a moderator.

O'Connor, Rudolf, and Peters (1980) discuss conceptual and methodological difficulties which may account for the lack of clear, consistent evidence demonstrating how individual differences affect job design outcomes. When individual differences and task characteristics are both measured by subjects' self-description, perceptual confounding may occur. O'Connor et al. (1980) state that this confounding may mask the effect of moderator variables on task characteristics/employee outcome relationships. More

objective measures of task characteristics may reduce the perceptual confound involved and provide clearer evidence of moderator effects. O'Connor et al. (1980) also state that research conducted on intact work groups often shows marked similarity of individual characteristics throughout members of the group. This occurs partly because organizations hire employees partly on the basis of their individual characteristics and because workers tend to join groups consisting of others who share their needs and abilities. When dividing the groups into high and low levels with respect to individual characteristics, one may find no significant difference between the levels. The use of moderated regression analysis (Peters & Champoux, 1979) may offer a solution to this problem. O'Connor et al. (1980) also point out that as sample size decreases, the probability of rejecting the null hypothesis statistically decreases as well. Thus, with an inadequate (too small) sample size, one may be prevented from rejecting the null hypothesis that the moderator variable is not significant because of the small sample size rather than because the null hypothesis is correct.

Peters and Champoux (1979) and Champoux and Peters (1980) have described applications of moderated regression in job design research as a method of analysis superior to subgroup analysis. One problem encountered when employing subgroup analysis to examine the effect of moderator variables on the

relationship between job characteristics and outcome variables is the necessity of making an arbitrary decision as to where to divide the distribution of continuous moderator variables. O'Connor et al. (1980) pointed out that this problem was common to many studies of moderator variables. In addition, researchers often divide their subjects into thirds or fourths by score on the moderator variable and conduct the subgroup analysis only on the top and bottom scoring groups. Thus, a great deal of the data obtained is wasted. The use of moderated regression eliminates the need for arbitrarily dividing the data at some point and allows one to use all of the data gathered as the moderator variable is added into a single equation model.

Another argument for the use of moderated regression is the additional information that might be gained from its use (Peters & Champoux, 1979). Moderated regression can identify the interactive effect of the moderator with a main effect variable. This interactive effect can sometimes substantially change the recognized effect of the moderator variable on job design relationships, perhaps for a substantial part of the sample. In addition, when an interactive effect is detected, the moderated regression model may indicate where job redesign efforts would be expected to produce the most extensive benefits. For instance, due to the interactive effect between GNS and MPS used as an example by Peters and

Champoux (1979), one recognizes that individuals scoring high in GNS, but in low MPS jobs, would provide a relatively large increase in the outcome variable per unit increase in MPS. Thus, in attempting to improve the aggregate employee outcomes of an organization, the manager could direct his efforts to those employees expected to provide the most return for those efforts.

A great deal of research has been conducted examining the effect of moderator variables on task characteristics/employee outcome relationships. However, as pointed out by O'Connor et al. (1980) and Griffin et al. (1981), findings have been inconsistent and the observed effect of moderator variables has been weak. Conceptual and methodological difficulties in past research studies may have created perceptual confounding, thus masking the effect of moderator variables on job design outcomes. The application of moderated regression, as described by Champoux and Peters (1980), may be of value in job design research as a means of eliminating the arbitrary division of data into subgroups and eliminating the waste of some portion of the data. If the various difficulties encountered in previous job design research are effectively dealt with, a consistent, clear body of knowledge concerning moderator effects may yet be accumulated.

Need For Achievement

Need for achievement (n Ach) is an important individual differences variable which has only recently been studied in conjunction with job design research. Need for achievement represents an individual's tendency to strive for achievement of success (Albanese, 1981, p. 247). By itself, n Ach has often been considered in work-related studies and has been specifically tested as a moderator in job design to a limited extent (Steers & Braunstein, 1976). The Manifest Needs Questionnaire (MNQ) was developed by Steers and Braunstein (1976) to measure n Ach as well as need for affiliation (n Aff), need for dominance (n Dom), and need for autonomy (n Aut). The MNQ was developed and validated with three studies and a total of 593 subjects. In the first study, 96 management students employed in a variety of full- or part-time jobs completed the MNQ and the Personality Research Form (PRF) developed by Jackson (1967). Faculty members familiar with the subjects rated the students with respect to the needs on the MNQ. Finally, the students took part in a controlled experiment to determine what behavioral preferences they displayed with respect to the four needs. Results of the above comparisons indicated that the MNQ provided a reliable and valid measure of the four needs of interest. The measure of n Ach was particularly well correlated with the other measurements of this need (PRF, faculty ratings, and displayed behavioral preferences).

Study 2 (Steers & Braunstein, 1976) was concerned in part with the effects of job characteristics on performance as moderated by *n* Ach. Data were obtained on 115 white-collar workers in an automotive firm. Dividing the sample at the median score into high-*n* Ach and low-*n* Ach groups, correlations between job characteristics and supervisory appraisals of performance were calculated for each group. The high-*n* Ach subjects exhibited a positive correlation between more enriched jobs (as existing in the firm) and performance, while no such effect was observed for the low-*n* Ach individuals. In study 3, including data from 382 hospital employees, *n* Ach was found to be significantly related to several job attitudes (job involvement, organizational commitment, career satisfaction, and personal importance to the organization), job performance, hierarchical level, and the leadership ability of self-confidence. The authors concluded that the MNQ appeared to provide a reasonably reliable and valid measure of *n* Ach (and the other three needs measured), and results obtained were consistent with existing theory concerning the relationship of these needs with the various other measures observed.

Researchers (Steers & Spencer, 1977; Stone, Mowday, and Porter, 1977) have employed subgroup analysis and moderated regression to evaluate the moderating effect of *n* Ach on the relationship between job characteristics and employee outcomes.

Steers and Spencer (1977) extended the evaluation of the data gathered by Steers and Braunstein (1976) by considering in more detail the effects of n Ach on employee outcomes. In applying moderated regression to the data, it was determined that n Ach moderates the relationship between job characteristics and performance at the .10 level of significance, but did not moderate the job characteristics/organizational commitment relationship. Stone et al. (1977) obtained data on 340 manufacturing company employees in an attempt to determine the moderating effect of n Ach on the relationship between job characteristics and satisfaction with the work itself. Job characteristic measurements were obtained by administration of a 13-item instrument (Stone, 1974). Satisfaction with the work itself was measured by the Brayfield-Rothe (1951) Job Satisfaction Index, and the measure of n Ach was obtained by administration of the PRF (Jackson, 1967). Both moderated regression analysis and subgroup analysis indicate that n Ach moderates the relationship between job characteristics and satisfaction. However, the subgroup analysis (comparing the bottom, middle, and top thirds of the sample) indicated that a stronger correlation was observed between job characteristics and satisfaction for low- and medium-strength n Ach subjects. Stone et al. (1977) note that this is inconsistent with what one would expect based on previous studies (Hackman & Lawler, 1971; Wanous,

1974) concerned with the relationships between job characteristics and satisfaction when considering higher order need variables as moderators.

Evans, Kiggundu, and House (1979) tested the job characteristics model developed by Hackman and Oldham (1975) and examined the moderating effects of GNS and n Ach. Data were obtained on 343 employees of a large automotive assembly plant in the midwest. In measuring n Ach, Evans et al. (1979) used the measure of motive to succeed obtained from the Thematic Apperception Test (TAT). The stimulus sentence version of the TAT was used under a timed condition. The JDS was used to obtain measures of general satisfaction, intrinsic motivation, work motivation, the core job characteristics, and GNS. Subject evaluations of their own and their peers' job performance were used as a performance measure. Turnover was measured as the employee's intent to leave the organization rather than actual observed turnover. Measures of specific satisfactions with the work itself, supervision, and promotion were obtained from the JDI (Smith, Kendall, & Hulin, 1969). Analysis of the moderator effects of GNS and n Ach was accomplished by comparing the top and bottom thirds of the sample on each measure.

Results of the Evans et al. (1979) study indicate that neither GNS nor n Ach moderate the job characteristics/employee outcome relationships to a great degree. The authors

note, however, that n Ach may be a more stable personality trait than GNS. They refer to Hackman and Oldham's (1975) study which detected a relationship between GNS and the demographic attributes of age, sex, and education. The Evans et al. (1979) study also notes these relationships, while none are observed for n Ach. If n Ach is relatively stable, one would not expect to be able to raise its level in employees through training, education, or other means in order to enhance performance or other employee outcome variables.

The individual differences variable, n Ach, appears to be related to several organizational outcome variables such as satisfaction and performance. However, evidence of the moderating effect of n Ach on job characteristics/employee outcome relationships has been inconsistent, sometimes demonstrating a stronger relationship for higher- n Ach individuals, sometimes no effect and, in one case (Stone et al., 1977), a weaker relationship for high- n Ach individuals. A great deal of further research must be done before the true moderating effect of n Ach in job design relationships can be determined.

Job Performance

One of the most common outcome variables studied is job performance (Griffin, Welsh, & Moorhead, 1981; Pierce & Dunham, 1978). Griffin et al. (1981) maintained that performance should be given greater consideration in organizational research because increased knowledge of employee

performance would be an important step towards our society's productivity growth rate. Additionally, they mention that a better understanding of the factors influencing performance within the organizational setting is necessary if researchers are to make meaningful contributions to organizational managers.

Historically, job performance, when viewed as an outcome variable, was measured objectively in terms of quantity and quality. Following the Hawthorne studies, researchers gained interest in perceptual measures of outcomes. The more recent studies have focused on perceptual measures of attitudes, behavior, and job characteristics in order to predict job performance.

In their literature review, Griffin et al. (1981) examined 13 studies which investigated the research that had been accomplished on the job characteristics/employee performance relationship. The objective of their efforts was to evaluate the inconclusive and contradictory results of these studies. Their overall conclusion identified the cause as the lack of valid and meaningful performance measures. Such a definitive conclusion was not found in the Pierce and Dunham (1976) literature review of job characteristics (task design). Pierce and Dunham identified problems with main effect investigations which included assumed causality between task design and employee responses and inadequate measurement of perceived job characteristics. Pierce and Dunham (1976)

stated that the evidence examined in their literature review implied that "Affective and motivational responses were more strongly related to task design than were the behavioral responses" (p. 87). In essence, Pierce and Dunham supported Hackman and Oldham's (1976) test of their theory, that the performance relationship with the summary motivating potential score was generally smaller and not as strong as expected. Hackman and Oldham suggested, as a reason, that behavioral outcomes were not as closely related to the individual responses to the job characteristics, nor the psychological states, as were affective reactions of employees to their work.

Job Satisfaction

A great deal of research has been conducted in job design, particularly looking at job characteristics which would be more satisfying to workers. This area has gained momentum over the past years and, one expert, J. Richard Hackman (1981), suggests that work design may play an even more important role for management in the future years. Hackman offers two points of view, design jobs to fit people or design the job, then help people adjust and adapt to these jobs. Both ideas support the central theme of providing jobs that are satisfying to the employee, as well as stimulating quality and/or quantity of performance and the desire to stay on the job.

A statistical sampling study by Andrews and Withey (1976) investigated Americans' perceptions of life quality on a national level. One measurement variable included in their measurement instrument involved affective evaluations of satisfaction for various concerns (e.g., one's work, job career). The measurement technique was based on interviews or questionnaires that were answered on a seven-item Likert-type scale ranging from Delighted to Terrible (abbreviated and referred to as the D-T scale). The authors

believe that a person's feelings about his or her life have an importance--and hence a claim to be considered as social indicators--in their own right. A person's feeling of "delight" or "satisfaction" or "unhappiness," or whatever else may be the feeling, engendered by some aspect of life is itself a significant fact. For the person himself, the mixture of different feelings he has about life is an important part of what life is. If enhancement, maintenance, and/or redistribution of well-being are significant concerns of society, as we believe they are, then the lives people are actually experiencing are worth knowing about. (Andrews & Withey, 1976, pp. 176-177)

As a result of their study, they estimated that the average satisfaction level for the American worker was "mostly satisfied" (p. 278) toward their work.

Lawler and Porter (1967) recognized the importance of job satisfaction as more than just the intrinsic value perceived by workers. That is, it was generally accepted that a relationship existed, regardless of how small, between satisfaction and performance. More than that, Lawler and Porter pointed out that many studies have concluded a strong

link between absenteeism and satisfaction, as well as between turnover and satisfaction. Therefore, organizations wishing to reduce the absenteeism and turnover rates should tend to focus on the satisfaction of their employees. As a result of their empirical study of 148 middle- and lower-level managers, they found significant evidence to support their hypothesis that satisfaction depends on performance, or performance may tend to cause satisfaction. Bhagat (1982) and Ivancevich (1979) found similar results, that job performance causes or predicts job satisfaction.

The implications from the notion that performance tends to cause satisfaction provides managers with a sounder frame of reference when investigating work design in the organizational setting. The evidence from the studies support the contention that, at least in certain jobs, satisfied employees are better performers, although in other jobs there is no meaningful relationship between satisfaction and performance. Therefore, managers should be aware of the degree of task stimulation and the form of satisfaction available to the job occupants. Bhagat (1982) points out that in his sample, intrinsic satisfaction appears to influence performance on high stimulation-type jobs, while extrinsic satisfaction appears to be related to performance on low stimulation-type jobs.

Job Involvement

The impetus for the study of job involvement comes from its potential importance from both the personal and organizational perspective. Early researchers (Lodahl & Kejner, 1965) defined job involvement as "the degree to which a person is identified psychologically with his work in his total self-image" (p. 24). For their study, they defined job involvement "as the degree to which a person's work performance affects his self-esteem" (p. 25). These definitions provide the groundwork for operationalizing constructs in terms of worker's involvement in their work, in the organization setting, and the job motivational consequences, from a personal perspective. To support these constructs, they developed a 20-item Likert-type scale measurement instrument which was administered to nursing and engineering personnel. Significant results of their study provided support for the utility of their measurement instrument as a means of investigating the influence of job scope on job involvement.

Other researchers also investigated the operational constructs and measurements of job involvement (Abdel-Halim, 1979; Lawler & Hall, 1970; Rabinowitz, Hall, & Goodale, 1977; Saleh & Hosek, 1976). Lawler and Hall (1970) identified the need to clearly define job involvement if it is to be treated as an independent job attitude factor. They accepted the definition of Lodahl and Kejner (1965) that is, job involvement

is "the degree of psychological identification with one's work" (p. 306) and focused their study on 291 research and development scientists in an attempt to distinguish between job involvement, job satisfaction, and intrinsic motivation. They found from their results that job involvement was significantly "related to job characteristics and to job behavior measures" and "seems to be a distinctive job attitude . . . that should be thought of as conceptually and empirically separate from satisfaction attitudes and intrinsic-motivation attitudes" (p. 306).

Notwithstanding the conceptual complexity, Saleh and Hosek (1976) reviewed the various interpretations of job involvement and attempted to clarify them through their study. Their study of 140 male and 105 female undergraduate university students found three job attitude factors that very closely paralleled the three job attitudes identified by Lawler and Hall (1970). Their factor labels of "active participation," "central life interest factor," and "centrality of performance to self-esteem" were similar in structure to the Lawler and Hall factors of "satisfaction," "job involvement," and "intrinsic motivation," respectively (p. 221). Saleh and Hosek further explained that these three factors were factorially different, but a common element of self or the self-concept existed between them. They, therefore, concluded their study with the notion that job involvement can be conceptually thought of as "the degree

to which the person identifies with his job, actively participates in it, and considers his performance important to his self-worth" (p. 223).

Based on the conclusions of Lawler and Hall (1970), two empirical studies were performed to investigate the predictability of job involvement, as a distinctive outcome variable, based on task characteristics (Abdel-Halim, 1979; Rabinowitz, Hall, and Goodale, 1977). Rabinowitz et al. (1977) compared the moderating effects of individual differences (growth need strength, locus of control, and belief in the Protestant work ethic) with the importance of job scope in predicting job involvement. They measured job characteristics of 332 Canadian provincial government ministry personnel using Hackman and Lawler's (1971) measures of core job characteristics (variety, autonomy, task identity, and feedback). The results of the Rabinowitz et al. study provided evidence that job scope and individual differences equally contributed in the prediction of job involvement. Also, the moderating effect of individual differences on job scope did not significantly add to the prediction of job involvement. Abdel-Halim (1979) examined the moderating effects of individual differences, particularly growth need strength and interpersonal satisfactions, on the job characteristics to job satisfaction and job involvement relationships. Job characteristics were measured on 89 managerial and professional personnel with the JDS (Hackman and Oldham, 1975).

Conclusions similar to those of Rabinowitz et al. (1977) were reached by Abdel-Halim (1979) concerning the moderating effects of individual differences on task characteristics in predicting job involvement. The practical implications of the studies concerning job involvement are obvious from a job redesign or job enrichment aspect. Findings indicate that higher measures of job involvement may be found in jobs that are high in job scope as well as for jobs in which employees have higher measures of growth needs strength.

Research Hypotheses

1. The job characteristic variables, stress, and need for achievement significantly predict job performance.

While several studies (Griffin et al., 1981) have related job characteristics to job performance, few have considered stress in conjunction with this relationship. In addition, much remains to be learned concerning the role of n Ach in determining employee outcomes.

2. The job characteristic variables, stress, and need for achievement are unique, significant predictors of job performance.

Through test of a subset in regression analysis, the individual predictive contribution of each independent variable can be determined with respect to job performance.

3. The interaction terms of need for achievement with the job characteristic variables and stress significantly add

to the prediction of job performance above and beyond the main effect of job characteristic variables, stress, and need for achievement.

As indicated by Peters and Champoux (1979) and Champoux and Peters (1980), the interactive effect of a moderator variable can have a substantial effect on job design analysis. The interactive effect of n Ach with each independent variable can be evaluated through moderated regression and test of a subset. With similar reasoning, hypotheses for job satisfaction and job involvement were developed.

4. The job characteristic variables, stress, and need for achievement significantly predict job satisfaction.

5. The job characteristic variables, stress, and need for achievement are unique, significant predictors of job satisfaction.

6. The interaction terms of need for achievement with the job characteristic variables and stress significantly add to the prediction of job satisfaction above and beyond the main effect of job characteristic variables, stress, and need for achievement.

7. The job characteristic variables, stress, and need for achievement significantly predict job involvement.

8. The job characteristic variables, stress, and need for achievement are unique, significant predictors of job involvement.

9. The interaction terms of need for achievement with the job characteristic variables and stress significantly add to the prediction of job involvement above and beyond the main effect of job characteristic variables, stress, and need for achievement.

CHAPTER III

METHODOLOGY

Introduction

This chapter is divided into three subsections concerning data collected in this research effort. First, the research sample is discussed. Secondly, data collection is discussed in terms of the research instrument used and, finally, statistical procedures used in data analysis are described, including reliability testing of instrument measurements, Pearson product moment coefficients, and multiple regression analysis.

Research Sample

The data collection instrument used in this study was administered to 691 respondents by an Air Force Institute of Technology (AFIT) researcher during a three-day period in October 1982. Administration was conducted in groups ranging in size from 25 to 100 respondents. Nonrated military and civilian members of a civil engineering and two missile maintenance organizations completed the questionnaire on a voluntary basis. The research site was a large DOD installation.

Measurement Instrument

The data collection instrument is the AFIT SURVEY OF WORK ATTITUDES, a composite of closed response questions taken from existing survey instruments and others developed by AFIT personnel. Responses to 137 items (individual questions) are entered in "soft lead" pencil on a computer scored response form. A unique, five-digit control number is assigned to each form. After completing the form, respondents are asked for this control number and their social security number by an organizational member acting as an intermediary in the survey procedure. This person does not have access to the responses to any questionnaire, thus maintaining employee anonymity while allowing subsequent administrations of the questionnaire to be paired with the correct respondent. In this manner, changes in employee attitudes may be identified and tracked through future administrations without compromising the anonymity of the respondents. Valuable knowledge may be attained if the effects of changes in independent variables can be observed in corresponding changes in outcome variables for employees. For instance, the effect of changing certain job characteristics for the purpose of improving job satisfaction can be evaluated through this feature of the survey instrument administration.

This comprehensive instrument is divided into two parts and collects data over a wide range of response categories

related to work attitudes, job design, and individual characteristics. The specific categories are: Background Information, Job Satisfaction, Job Performance, Job Effort Rating, Future Work Plans, Organizational Information, Job Information (including Job Involvement), Work Role Attitudes (including Stress), Work Goals, Job Characteristics (including Skill Variety, Task Identity, Task Significance, and Autonomy), Job Feedback, Task Preferences (including n Ach), Task Demands, Situational Attributes, Goal Agreement, Self-Perceived Ability, and Organizational Perceptions. Many areas of research are suggested by an examination of these categories. However, in this research effort, the focus is on only the response variables described in the previous section. Each of these categories will be discussed below.

Job satisfaction is the perceptual rating of how the worker feels about the job, co-workers, the work itself, and the task environment on a scale ranging from "Delighted" to "Terrible" (Andrews & Withey, 1976, pp. 18-19). This variable is measured by questions 8-12 in Part I by the respondent's choice of the statement best representing his/her opinion on each question. Choice of responses is on the 7-point Likert scale below:

- 1 = Delighted
- 2 = Pleased
- 3 = Mostly Satisfied
- 4 = Mixed

5 = Mostly Dissatisfied

6 = Unhappy

7 = Terrible (Andrews & Withey, 1976)

Example: Item 8. How do you feel about your job?

Job performance is the perception of the worker as to how his/her supervisor rates him/her in several areas of performance in comparison to other workers doing similar jobs. These areas are quantity of work produced, quality of work produced, efficiency in using resources, ability to anticipate problems, and adaptability/flexibility in handling high-priority work (Mott, 1972). Job performance is measured by questions 13-17 in Part I, whereby the respondent offers his/her perception of the supervisor's evaluation of his/her performance based on formal and informal feedback received in the past. A 7-point Likert scale rates the worker as he/she compares to other employees doing similar work. Choices on this scale are:

1 = Far Worse

2 = Much Worse

3 = Slightly Worse

4 = About Average

5 = Slightly Better

6 = Much Better

7 = Far Better (Steel & Ovalle, 1982)

Example: Item 13. Compared with other employees doing similar work, your supervisor considers the quantity of the work you produce to be:

Job involvement is the degree to which the worker identifies with his/her work, actively participates in it, and perceives his/her performance as important to a feeling of self-worth (Saleh & Hosek, 1976). Job involvement, a subsection of the Job Information category, is measured by questions 35-39 in Part I. The worker expresses relative agreement/disagreement with statements concerning the job. A 7-point Likert scale is used with the following responses:

- 1 = Strongly Disagree
- 2 = Moderately Disagree
- 3 = Slightly Disagree
- 4 = Neither Disagree Nor Agree
- 5 = Slightly Agree
- 6 = Moderately Agree
- 7 = Strongly Agree (Saleh & Hosek, 1976)

Example: Item 42. The major satisfaction in my life comes from my work.

Stress is operationalized as the degree to which the worker feels he/she experiences stress and anxiety due to the job itself, relations with other employees, and general aspects of the organization, and is evaluated under the category of Work Role Attitudes by questions 55-57 in Part I. A measure of stress was developed by AFIT researchers for

this instrument because no well-established and widely-accepted measure of stress exists at this time. Because of this, the measure is presented here in greater detail and questions 55-57 are listed below.

Item 55. My job (e.g., the type of work, amount of responsibility, etc.) causes me a great deal of personal stress and anxiety.

Item 56. Relations with the people I work with (e.g., co-workers, supervisor, subordinates) cause me a great deal of stress and anxiety.

Item 57. General aspects of the organization I work for (e.g., policies and procedures, general working conditions) tend to cause me a great deal of stress and anxiety.

Respondents used the same 7-point Likert scale as used in the Job Information category to indicate the extent to which they agreed or disagreed with the above statements.

Questions 5-16 in Part II measure four of the job characteristics developed by Hackman and Oldham (1975). Skill variety is the degree to which the respondent felt variety was present in the job and whether or not the job was perceived to require use of complex, high-level skills. Conversely, how accurately the job could be described as simple and repetitive. Task identity is the extent to which the job involves completing a whole and identifiable piece of work and to which the worker perceives his/her opportunity to do an entire piece of work. Task significance is the

extent to which the job is perceived as significant or important both in its effects on other people and in the broader scheme of things. Autonomy is the degree to which the worker decides on his/her own how to accomplish work and the opportunity presented to use personal initiative, judgment, and independent action in doing the work (Hackman & Oldham, 1975). Skill variety (Questions 7, 9, and 11), Task identity (Questions 6, 10, and 14), Task significance (Questions 8, 12, and 16), and Autonomy (Questions 4, 13, and 15) are evaluated on a 7-point Likert scale ranging from Very Little (1) to Very Much (7), or Very Inaccurate (1) to Very Accurate (7) in determining to what degree each of the characteristics is present in the worker's job. The responses are perceptive measures of these characteristics, but objectivity is requested of respondents.

Feedback is the extent to which the worker feels he/she receives information from the supervisor and other sources concerning how well or poorly he/she is performing the job (Sims et al., 1976). Job feedback is measured by Questions 17-21 from the JCI (Sims et al., 1976) on a 5-point Likert scale on which the respondent is asked how he/she feels about information received about job performance and how much job feedback is present in the job. Responses range from Very Little (1) to Very Much (5). The JCI measure of feedback was used because research indicates that it provides more reliability than the JDS measure.

Need for achievement (n Ach) is defined as the relatively stable individual characteristic which predisposes an individual to strive for successful achievement of goals (Albanese, 1981, p. 247). Need for achievement is measured by Questions 22-26 in Part II, consisting of a self-rating on the degree to which the worker exhibits behavior associated with high or low need for achievement (Steers & Braunstein, 1976). The ratings are based on a 7-point Likert scale ranging from Never (1) to Always (7).

Examples: Item 22. I do my best work when my job assignments are fairly difficult.

Item 23. I try very hard to improve on my past performance at work.

This completes the discussion of data collection with the AFIT SURVEY OF WORK ATTITUDES for this research project. As noted beforehand, however, several other categories of data have been collected and are available for use in research. See Appendix to examine the entire instrument.

Data Analysis

This section describes a series of statistical procedures conducted on the data collected for this project. First, the internal consistency reliability of all measurements is evaluated with the Cronbach's alpha reliability coefficient. Next, the Pearson product moment correlation coefficient is used to check for multicollinearity and

indications of any linear relationships between independent and outcome variables. Finally, multiple linear regression is used to determine the effect of each independent variable on the outcome variables of interest. Each of these three statistical procedures is briefly described below with its specific application in this project.

Reliability

The concept of reliability, as used in this thesis, refers to the degree to which a measurement is free of random error. An instrument with high reliability allows one to draw conclusions with some degree of confidence from data observed, while the use of an unreliable instrument tends to greatly restrict our degree of understanding of the observed relationship. To understand the concept of reliability, consider a single measurement, X , composed of two components: t (the true value of that which is being measured), and ϵ (the random error associated with the measurement). Then,

$$X = t + \epsilon \quad (1)$$

and the reliability coefficient indicates the average accuracy of the measurement in estimating true value. When σ_o^2 represents the variance of the observed measurement, σ_e^2 is the variance of the measurement errors, and we assume independence of the random errors with respect to true scores; we define the reliability coefficient as

$$\rho_t = 1 - \frac{\sigma_e^2}{\sigma_o^2} \quad (2)$$

When all variation in observed measurements is due to measurement error, $\rho_t = 0$. When measurement error is zero, $\rho_t = 1$ (Nie, Hull, & Jenkins, 1975).

In this thesis, reliability of measurements in the survey instrument is of concern. In particular, it must be determined to what degree the instrument is internally consistent in its measurement of each scale. This determination is made by consideration of the internal consistency reliability of the instrument. This reliability is dependent on the extent to which a group of questions, all concerning the same variable, agree in their observed values.

The Statistical Package for the Social Sciences (SPSS) subprogram RELIABILITY is used to determine the internal consistency reliability of the survey instrument used in this study. The reliability coefficient used is the Cronbach's alpha, a widely used measure. In determining this value, one compares the responses to one-half of the questions composing each scale to the other half for all respondents in the sample. This procedure is repeated for every possible combination of such "split pairs," and an internal consistency reliability coefficient is calculated for each. The average value of these coefficients is the Cronbach's alpha reliability coefficient.

In this study, the Cronbach's alpha is calculated for each independent variable scale and for each outcome variable scale. Generally, values greater than .80 are desirable, but valuable albeit tenuous knowledge may be attained from instruments with reliability coefficients as low as .60.

Pearson Product Moment Correlation Coefficient

The term correlation refers to the linear relationship between two variables which may be represented by a single number called the correlation coefficient (Nie et al., 1975). This relationship reveals how closely a change in one variable is related to a corresponding change in the other.

The Pearson product moment correlation coefficient, r , indicates the strength of the linear relationship between two variables, ranging from -1.0 for perfect negative correlation to +1.0 for perfect positive correlation. In other words, if $r = -1.0$, every increase in one variable is accompanied by a corresponding decrease in the second variable. Similarly, if $r = +1.0$, every increase in one variable is accompanied by a corresponding increase in the other. An r value of zero indicates that no linear relationship exists between the two variables, although indeed, some other, nonlinear relationship might exist.

In this study, the Pearson's r is used for understanding of relationships between each of the independent and dependent variables. The SPSS subprogram, PEARSON CORR, gives the

Pearson's r value for every pair of variables in the sample data. The subprogram computes a measure of linear correlation between each variable and every other variable in turn. These Pearson's r values are useful in looking for two things: multicollinearity and independent linear relationships between individual independent and dependent variables.

Multicollinearity between two independent variables indicates that they contribute redundant information; i.e., the two variables are correlated with each other. When both variables are used to predict the value of a dependent variable, they contribute a certain amount of overlapping information, the amount of which depends on the degree of multicollinearity present. For instance, if autonomy is highly correlated with skill variety in this survey instrument, this implies that the two variables may largely measure the same thing. One may consider using only one of the two variables in a regression equation if their Pearson's r value is very high, resulting in a more parsimonious model with little loss of utility.

Examination of a Pearson's r value may reveal a strong linear relationship between an independent variable and some dependent variable. This relationship would be expected to be evident as well in regression analysis to follow. The existence of such a correlation is worthy of note in a

research report since it aids in understanding the relationship. It may provide a starting point for research in a related area.

Multiple Regression Analysis

Multiple regression analysis may be used as a descriptive tool in summarizing the dependence of an outcome variable on two or more independent variables and as an inferential tool evaluating relationships in a population based on examination of sample data (Nie et al., 1975). In multiple regression analysis, a regression model is developed which expresses an outcome variable, Y , as a function of two or more independent variables, X_i . For example,

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \quad (3)$$

represents a basic multiple regression model where Y is dependent on the values of X_1 and X_2 . β_0 , β_1 , and β_2 are constants. Multiple regression analysis assumes that for a given set of values of X_1, X_2, \dots, X_i , the error associated with each measurement is independent and normally distributed with a mean of zero and a variance of σ^2 (McClave & Benson, 1982).

In this thesis, multiple regression analysis is used both as a descriptive tool and an inferential tool. The SPSS subprogram REGRESSION is used to fit the sample data to a multiple regression model. In testing each of the nine

hypotheses of this thesis, backward regression (test of a subset) is used. This procedure tests the null hypothesis that a subset of predictor (independent) variables does not significantly contribute to prediction of the outcome variable. The \underline{F} test is used to determine whether or not the null hypothesis is rejected. Each research hypothesis is tested at the .05 and .01 significance (alpha) levels. The \underline{F} statistic is computed as follows:

$$\underline{F} = \frac{(\underline{R}^2_{FM} - \underline{R}^2_{RM}) / \underline{M}}{(1 - \underline{R}^2_{FM}) / (\underline{N} - \underline{k} - 1)} \quad (4)$$

where \underline{R}^2_{FM} = \underline{R}^2 value of the "full model"

\underline{R}^2_{RM} = \underline{R}^2 value of the "reduced model"

\underline{M} = number of predictor variables in the null hypothesis

\underline{N} = sample size

\underline{k} = total number of predictor variables

$v_1 = \underline{M}$ = number of variables in the subset deleted from the equation, numerator degrees of freedom

$v_2 = (\underline{N} - \underline{k} - 1)$ = denominator degrees of freedom

The null hypothesis is rejected for $\underline{F} > \underline{F}_{\alpha, v_1, v_2}$.

$\underline{F}_{\alpha, v_1, v_2}$ is obtained from a standard \underline{F} -distribution table for the given alpha level.

Hypothesis 1 is tested using this procedure as follows. The full model for predicting job performance includes the independent variables of skill variety, task identity, task

significance, autonomy, feedback, stress, and need for achievement which may be represented by X_1 , X_2 , X_3 , X_4 , X_5 , X_6 , and X_7 . The reduced model does not include need for achievement (X_7). Thus,

$$\begin{aligned} \text{Job Perf} = & \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \\ & + \beta_6 X_6 + \beta_7 X_7 \end{aligned} \quad (5)$$

represents the full model.

$$\begin{aligned} \text{Job Perf} = & \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \\ & + \beta_6 X_6 \end{aligned} \quad (6)$$

represents the reduced model.

To test the hypothesis that need for achievement does not significantly add to prediction of job performance, the following statistical test is conducted. If the statistical null hypothesis is rejected at a prescribed alpha level, one may infer that X_7 does not significantly contribute to prediction at that alpha level. Thus, the null hypothesis to test is:

$$H_0 : \beta_7 = 0 \quad (7)$$

The alternate hypothesis is:

$$H_a : \beta_7 \neq 0 \quad (8)$$

The test statistic, F , is calculated by the SPSS subprogram REGRESSION. If the calculated F value is greater than F_{α, v_1, v_2} , one rejects the null hypothesis. This would infer that need for achievement is a significant predictor of job performance at that alpha level. The other eight hypotheses of this thesis are tested in like manner.

CHAPTER IV

RESULTS

The results of this study are presented in three parts:
(a) Reliability of measures, (b) Correlations, and (c)
Regression analysis.

Reliability

The internal consistency reliabilities of each of the scales measured in this empirical study are presented in Table 1.

Table 1
Reliabilities of the Scales

Scale	Internal Consistency Reliabilities
Variety	.66853
Identity	.70265
Significance	.65194
Autonomy	.73228
Feedback	.91500
Stress	.75556
n Ach	.62871
Perceived Performance	.93738
Satisfaction	.78777
Involvement	.91523

Note. N = 679.

Internal consistency reliabilities range from a high of .93738 (perceived job performance) to a low of .62871 (need for achievement). The reliabilities of the core job dimensions obtained and presented here were generally comparable to those observed by Hackman and Oldham (1975). The JCI measure of feedback was the most reliable (.91500) of the task characteristics measures. The measure of stress, developed from theoretical notions rather than from existing literature, exhibited acceptable reliability (.75556) for this study. Of the dependent variable measures, perceived job performance and job involvement were the most reliable (.93738 and .91523, respectively), followed by job satisfaction (.78777). In general, the scales were found to be well within previous research guidelines for acceptable reliability for use in job design research.

Correlations

The data were analyzed using Pearson product moment correlation coefficients for the entire sample. The results for the core job dimensions, stress, and need for achievement are presented in Table 2.

The core job dimensions themselves are moderately positively intercorrelated, consistent with results found by previous researchers. The mean intercorrelation between the core job characteristics (variety, identity, significance, autonomy, and feedback) was .327. The mean intercorrelation

Table 2
Intercorrelations Among Independent Variables

	Variety	Identity	Signif- icance	Autonomy	Feedback	Stress	n Ach
Variety	-						
Identity	.313	-					
Significance	.431	.292	-				
Autonomy	.403	.406	.288	-			
Feedback	.246	.296	.191	.363	-		
Stress	.062	.216	.136	.241	.218	-	
n Ach	.207	.186	.256	.236	.221	-.017	-

Note. N = 681. Correlations > .10 are significant at the .01 level (two-tailed).

between the four job characteristics measured by the JDS (variety, identity, significance, and autonomy) was .354. As expected, there was virtually no intercorrelation between stress and need for achievement which supports their conceptual independence. In addition, stress and need for achievement have relatively low intercorrelations with the job characteristics.

Table 3 presents the correlations between the outcome variables (perceived job performance, job satisfaction, and job involvement) and the independent variables (job characteristics, stress, and need for achievement).

Table 3
Correlations With Outcome Variables

	Perceived Performance	Satisfaction	Involvement
Variety	.158	.367	.378
Identity	.153	.336	.193
Significance	.201	.316	.192
Autonomy	.221	.469	.317
Feedback	.328	.496	.298
Stress	.035	.348	.090
n Ach	.347	.227	.274

Note. N = 681. Correlations > .10 are significant at the .01 level (two-tailed).

All of the correlations between the independent and outcome variables, with the exception of stress/perceived performance and stress/involvement, were significant. In general, job satisfaction had the strongest correlations with the independent variables, ranging from a high of .496 for feedback, followed by .469 for autonomy and .367 for variety, to a low of .227 (need for achievement). Perceived job performance correlated most strongly with need for achievement (.347) and feedback (.328), while job involvement correlated most strongly with variety (.378), autonomy (.317), and feedback (.298). Feedback and autonomy, in general, correlated strongly with all three outcome variables.

Regression Results

Moderated regression was applied to test for significant interactions of *n* Ach with task characteristics on the outcome variables of this study. Due to missing data for several respondents, the actual sample size for statistical analysis was 681. The method of analysis chosen to test all but hypotheses 1, 4, and 7 will serve to minimize any effects due to multicollinearity.

The first research hypothesis was tested to determine the predictive range of the main effect independent variables for perceived job performance. The job characteristics, stress, and need for achievement variables significantly

predicted perceived job performance in a simultaneous regression model with $\underline{R}^2 = .19702$ ($p < .001$), $\underline{F}(7,673) = 23.59$.

The unique predictive value of each independent variable for perceived job performance was tested in the second research hypothesis. Results of regression analysis are presented in Table 4.

Table 4
Regression Results for Perceived
Job Performance

Predictor	\underline{R}^2 FM	\underline{R}^2 RM	\underline{R}^2 Increment
Variety	.19702	.19691	.00011
Identity	.19702	.19700	.00002
Significance	.19702	.19203	.00499*
Autonomy	.19702	.19420	.00282
Feedback	.19702	.14868	.04834***
Stress	.19702	.19571	.00131
n Ach	.19702	.13793	.05909***

Note. N = 681. FM represents full model; RM represents reduced model.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Results of the regression analysis indicate n Ach, feedback, and task significance combine additively to predict perceived job performance. The n Ach variable accounted for a significant increment in perceived job performance

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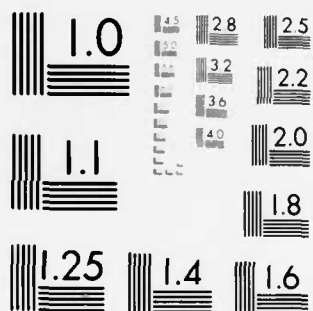
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variance of 5.9%, where $F(1,674) = 49.82$, $p < .001$. The feedback variable accounted for a significant increment in perceived job performance variance of 4.8%, where $F(1,674) = 40.76$, $p < .001$. Additionally, the task significance variable accounted for a significant increment in perceived job performance variance of .50%, where $F(1,674) = 4.21$, $p < .05$. Task variety, task identity, task autonomy, and stress did not significantly predict perceived job performance.

The regression model containing only the main effect variables was compared with the regression model containing both the main effect and interaction variables for each outcome variable. In each case, the subgroup of interaction terms of need for achievement did not appear to add significantly to the predictive value of the equation. Results are summarized in Table 5.

Table 5
Comparison of Models With Interaction Versus
Models Without Interaction

Outcome	R^2_{FM}	R^2_{RM}	R^2 Increment ^a
Job Performance	.20554	.19702	.00852
Job Satisfaction	.43130	.42051	.01079
Job Involvement	.24237	.22687	.01550

Note. N = 681.

^aEntering interaction terms of n Ach with all other independent variables.

* $p < .05$.

** $p < .01$.

The third research hypothesis investigated the interaction of need for achievement with the job characteristics and stress in predicting perceived job performance. In this test, each of the interaction terms is removed one at a time from the full job characteristics model to determine what portion of the variance in the outcome measure it accounted for. Results of the moderated regression are shown in Table 6.

Table 6
Moderated Regression Results for
Perceived Job Performance
With Interaction Terms

Predictor	R^2_{FM}	R^2_{FM}	R^2 Increment
Variety X n Ach	.20554	.20510	.00044
Identity X n Ach	.20554	.20347	.00207
Signif X n Ach	.20554	.20394	.00160
Autonomy X n Ach	.20554	.20524	.00030
Feedback X n Ach	.20554	.19994	.00560
Stress X n Ach	.20554	.20550	.00004

Note. N = 681.

*p < .05.

**p < .01.

None of the interaction terms of need for achievement significantly added to the prediction of perceived job performance. Thus, n Ach does not appear to moderate the task characteristics/perceived performance relationship in this sample.

The fourth, fifth, and sixth research hypotheses investigated the relationships of the independent variables with job satisfaction. The fourth hypothesis, testing the predictive value of job characteristics, stress, and need for achievement in a simultaneous regression model for the job satisfaction outcome variable, was supported with $R^2 = .42051$ ($p < .001$), $F(7,673) = 69.77$.

The fifth research hypothesis investigated the unique contributions of job characteristics, stress, and need for achievement in predicting job satisfaction. Results of the regression analysis are presented in Table 7.

Table 7
Regression Results for Job Satisfaction

Predictor	R^2_{FM}	R^2_{RM}	R^2 Increment
Variety	.42051	.40731	.01320***
Identity	.42051	.41913	.00138
Significance	.42051	.41479	.00572**
Autonomy	.42051	.39371	.02680***
Feedback	.42051	.34627	.07424***
Stress	.42051	.38282	.03769***
n Ach	.42051	.41761	.00290

Note. N = 681.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

The results of the regression analysis for job satisfaction indicate that all the independent variables except task identity and n Ach combine additively to predict job satisfaction. The feedback variable accounted for the largest increment in job satisfaction variance of 7.4%, where $F(1,674) = 87.50$, $p < .001$. The stress variable accounted for the next largest increment in job satisfaction variance of 3.8%, where $F(1,674) = 44.42$, $p < .001$. The autonomy variable accounted for the next greatest increment in job satisfaction variance of 2.7%, where $F(1,674) = 31.59$, $p < .001$. The skill variety variable accounted for a significant increment in job satisfaction variance of 1.3%, where $F(1,674) = 15.56$, $p < .001$. The task significance variable accounted for the smallest significant increment in job satisfaction variance of .57%, where $F(1,674) = 6.74$, $p < .01$.

The sixth research hypothesis investigated the interaction terms of need for achievement with job characteristics and stress in predicting job satisfaction. Results of the moderated regression are shown in Table 8.

As were the results for predicting job performance, none of the interaction terms of need for achievement significantly added to the prediction of job satisfaction. Thus, it appears that n Ach does not moderate the task characteristics/satisfaction relationship.

Table 8
Moderated Regression Results for
Job Satisfaction With
Interaction Terms

Predictor	R^2_{FM}	R^2_{RM}	R^2 Increment
Variety X n Ach	.43130	.43102	.00028
Identity X n Ach	.43130	.42618	.00512
Signif X n Ach	.43130	.42977	.00153
Autonomy X n Ach	.43130	.43027	.00103
Feedback X n Ach	.43130	.43123	.00007
Stress X n Ach	.43130	.42970	.00160

Note. N = 681.

* $p < .05$.

** $p < .01$.

The seventh, eighth, and ninth research hypotheses investigated the relationships of the independent variables with job involvement. The seventh hypothesis tested the predictive value of job characteristics, stress, and need for achievement for predicting the job involvement outcome variable in a simultaneous regression model. The hypothesis, that the independent variables significantly predicted job involvement, was supported with $R^2 = .22687$ ($p < .001$), $F(7,673) = 28.21$.

The eighth research hypothesis tested the unique contribution of each of the independent variables to the prediction

of job involvement. Results from the regression analysis are presented in Table 9.

Table 9
Regression Results for Job Involvement

Predictor	R^2_{FM}	R^2_{RM}	R^2 Increment
Variety	.22687	.17382	.05305***
Identity	.22687	.22672	.00015
Significance	.22687	.22609	.00078
Autonomy	.22687	.21676	.01011**
Feedback	.22687	.20742	.01945***
Stress	.22687	.22652	.00035
n Ach	.22687	.20289	.02398***

Note. N = 681.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

The results of the regression analysis for job involvement indicate that skill variety, n Ach, feedback, and autonomy combine additively to predict job involvement. The skill variety variable accounted for the largest increment in job involvement variance of 5.3%, where $F(1,674) = 46.18$, $p < .001$. The n Ach variable accounted for the next largest increment in job involvement variance of 2.4%, where $F(1,674) = 20.87$, $p < .001$. The feedback variable accounted for the next largest increment of job involvement variance

of 1.9%, where $F(1,674) = 16.93$, $p < .001$. The autonomy variable accounted for the smallest significant increment in job performance variance of 1.0%, where $F(1,674) = 8.80$, $p < .01$. Identity, significance, and stress did not significantly add to the prediction of the job involvement outcome variable.

The ninth research hypothesis investigated the predictive value of the interaction terms of need for achievement with the job characteristics and stress for predicting job involvement. The results of moderated regression are presented in Table 10.

Table 10
Moderated Regression Results for
Job Involvement With
Interaction Terms

Predictor	R^2_{FM}	R^2_{RM}	R^2 Increment
Variety X n Ach	.24237	.23430	.00807
Identity X n Ach	.24237	.24121	.00116
Signif X n Ach	.24237	.24214	.00023
Autonomy X n Ach	.24237	.24139	.00098
Feedback X n Ach	.24237	.24136	.00101
Stress X n Ach	.24237	.24228	.00009

Note. N = 681.

* $p < .05$.

** $p < .01$.

None of the interaction terms of need for achievement significantly added to the prediction of the outcome variable, job involvement. Thus, it appears that n Ach does not exert moderator effects on the task characteristics/job involvement relationship for this sample of individuals.

Summary of Regression Results

The results of this study indicated that the model including job characteristics, stress, and n Ach significantly predicted ($p < .001$) the three employee outcome variables: job performance, job satisfaction, and job involvement in simultaneous regression models. A summary of the unique significant increments of outcome variable variance accounted for by each independent variable is presented in Table 11. The feedback measure accounted for a significant increment in the variance of each of the outcome variables, while task identity did not account for a significant increment for any of the three outcomes.

Autonomy and skill variety each accounted for a significant increment in the variances of satisfaction and involvement, but not in the variance of performance. Task significance accounted for a significant increment in the variances of satisfaction and performance, but did not significantly add to prediction of involvement. Stress accounted for a significant increment only in the variance of satisfaction while n Ach accounted for a significant increment

Table 11
Independent Variables Accounting for
Unique Significant Increments in
Outcome Variable Variance

Independent Variables	Outcome Variables		
	Perceived Performance	Job Satisfaction	Job Involvement
Variety	No	Yes***	Yes***
Identity	No	No	No
Significance	Yes*	Yes**	No
Autonomy	No	Yes***	Yes**
Feedback	Yes***	Yes***	Yes***
Stress	No	Yes***	No
n Ach	Yes***	No	Yes***

Note. N = 681.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

in the variances of performance and involvement, but not in the variance of satisfaction. The n Ach variable did not appear to moderate any of the relationships between the job characteristics and the employee outcome variables considered in this study.

CHAPTER V

DISCUSSION/RECOMMENDATIONS

Research Hypotheses

As expected, regression analysis provided strong support for Hypothesis 1, that the full job characteristics, stress, and need for achievement model significantly ($p < .001$) predicted perceived job performance. This is consistent with past research concerning the job characteristics/perceived performance relationships (Hackman & Oldham, 1976). The main effects of stress and n Ach on perceived job performance were not explicitly examined in the first hypothesis and can be more clearly understood when examined individually. As a whole, strong support is exhibited for the validity of this study's full job characteristics model for predicting perceived job performance.

In order to narrow the focus of the investigation, in testing Hypothesis 2, the predictive contribution of each unconfounded independent variable was determined with respect to perceived job performance. Feedback and n Ach contributed most significantly ($p < .001$) to the prediction of perceived job performance, while task significance contributed at the .05 level. Previous researchers (Griffin, 1981; Hackman & Lawler, 1971; Steers & Braunstein, 1976) have examined the

Pearson product moment correlations between task characteristics and performance, providing some understanding of the task characteristics/job performance relationship. The strong contribution of n Ach to the prediction of perceived performance was expected and consistent with previous research (Steers & Braunstein, 1976), while the significant contribution of feedback in predicting performance has generally been found less frequently (Griffin, 1981; Hackman & Lawler, 1971). The nonsignificant contribution of variety, identity, and autonomy in predicting perceived performance is typical of previous research (Griffin, 1981; Hackman & Lawler, 1971) which has seldom found significant correlations between these three job characteristics and job performance. The contribution of stress to predicting perceived job performance was also nonsignificant. Existing knowledge related to stress/job outcome relationships has concentrated on affective outcomes almost exclusively. Results of this sample indicate that perceived performance is unaffected by the amount of job stress encountered, as measured in this study.

It is important to note that in testing Hypothesis 2, the unique, nonconfounded effects of each of the independent variables is examined with regard to the prediction of perceived performance. Although the full model of job characteristics, stress, and n Ach was significantly predictive of this outcome variable, it was demonstrated that only some

of the independent variables accounted for significant increments in perceived job performance variance. The unique contributions of the individual task characteristics have not been examined in previous research studies. Thus, a more parsimonious theoretical model for predicting perceived performance may result if certain task characteristics are consistently found to be nonsignificant predictors and eliminated from the predictive model.

A test of Hypothesis 3 determined that none of the interaction terms between *n* Ach and either the job characteristics or stress significantly added to the prediction of perceived performance despite the strong main effect of *n* Ach. Evans et al. (1979) also found no moderating effect of *n* Ach for the job characteristics/perceived performance relationship. However, a significant moderating effect was found by other researchers (Steers & Braunstein, 1976; Steers & Spencer, 1977). Because high-*n* Ach workers enjoy moderately challenging tasks and frequent feedback (Albanese, 1981, p. 247), both provided in enriched jobs, one might expect them to expend more effort in such jobs and evidence improved performance.

Hypothesis 4 stated that the full job characteristics, stress, and *n* Ach model predicts job satisfaction. Strong support for this hypothesis is exhibited as the full model of simultaneous regression significantly ($p < .001$) predicted

job satisfaction. The predictive value of the job characteristics for job satisfaction is well-documented (Griffin, 1981; Hackman & Oldham, 1976; Umstot et al., 1976). Little is known concerning the value of stress and n Ach in predicting job satisfaction.

In testing Hypothesis 5, it was determined that stress and each of the core job characteristics, with the exception of task identity, significantly accounted for unique variance in the prediction of job satisfaction. The stronger relationships between job characteristic variables and satisfaction, as compared to job characteristics/perceived performance relationships, are consistent with existing knowledge (Griffin, 1981; Hackman & Lawler, 1971; Umstot et al., 1976). Previous researchers (Gupta & Beehr, 1979; Sarason & Johnson, 1979) have hypothesized and generally confirmed a negative relationship between undesirable types of stress and job satisfaction. The results of this study also found a significant relationship between greater amounts of stress and lower job satisfaction. Finally, n Ach does not appear to be significantly related to job satisfaction.

In testing Hypothesis 6, it was determined that none of the interaction terms for n Ach and task characteristics were significantly predictive of job satisfaction. It is interesting to note, however, that the interaction of the only

two variables not having a significant main effect on satisfaction (identity X n Ach), is the interaction term most closely approaching significance in this prediction equation (significant at the .10 level). This may indicate some relationship between task identity and n Ach with regard to job design research. Possibly, an individual's n Ach is related more closely to a "full piece of work" than to work activities in general. In this case, higher job satisfaction might be related to the combination of high n Ach and high task identity, but not to either alone. Previous research examining the moderating effect of n Ach on the job characteristics/satisfaction relationship has been confusing. Steers and Braunstein (1976) found that n Ach was significantly related ($p < .001$) to career satisfaction, while Stone et al. (1977), using moderated regression, found n Ach to significantly moderate ($p < .01$) the relationships between job scope and satisfaction with the work itself. However, Stone et al.'s subgroup analysis of the same data (Stone et al., 1977) showed that those subjects scoring in the highest third on n Ach exhibited a substantially lower correlation between job scope and satisfaction than those in the lower and middle score ranges. This finding contradicted the researchers' initial expectations. Finally, Evans et al. (1979) found no moderating effect for n Ach on the job characteristics/satisfaction relationship.

The test of Hypothesis 7 indicated that the full model of job characteristics, stress, and n Ach significantly predicts job involvement. The importance of job characteristics in predicting job involvement is consistent with existing knowledge (Abdel-Halim, 1979; Rabinowitz et al., 1977). The relationships of stress and n Ach with job involvement have not been thoroughly explored, but will be considered individually.

A test of Hypothesis 8 revealed that variety, autonomy, feedback, and n Ach significantly add to prediction of job involvement. Task identity, significance, and stress did not. Steers and Braunstein (1976) also found a significant relationship between n Ach and job involvement. The negligible effect of stress on job involvement contrasted with expectations of a negative relationship based on existing literature. Brief et al. (1981, p. 53) state that when employees experience negative stress, one might expect a negative effect on certain psychological symptoms such as job involvement. One might reasonably expect that if an employee experiences a great deal of stress and anxiety on the job, he or she may become alienated from that job, thus decreasing experienced job involvement.

In testing Hypothesis 9, none of the interaction terms of n Ach were determined to contribute to prediction of job involvement. Rabinowitz et al. (1977) found no interaction

between individual differences variables and job scope in the prediction of job involvement.

The hypotheses that the interaction terms of task characteristics and n Ach would predict each of the outcome variables were not supported by the results of this empirical study. These findings were not expected as need for achievement was assumed to have more moderating potential than was exhibited, particularly for predicting employees' perceptions of job performance. In addition, the hypotheses concerning the unique contribution of each of the independent variables in predicting the three outcome variables were generally supported, although empirical support was found for fewer variables than similar previous empirical investigations would indicate. In no case did all of the independent variables account for a significant increment in the variance of the outcome variable examined. For example, only task significance ($p < .05$), feedback, and n Ach ($p < .001$) uniquely predicted perceived performance. Variety, autonomy, feedback, stress ($p < .001$) and task significance ($p < .01$) significantly added to the prediction of satisfaction. Finally, variety, feedback, n Ach ($p < .001$), and autonomy ($p < .01$) were found to account for significant increments in the variance of job involvement. Thus, the results of this study indicate that only some job characteristics add to the prediction of each of the outcome variables considered.

Knowledge Gained

The full job characteristics model exhibited a strong relationship with each of the outcome variables for this sample. The measure of feedback used in this study was found to account for a significant increment in the variance of each of the outcome variables examined. A high level of feedback apparently enables the workers to continuously "correct their aim" to improve their performance on the job. In order to accurately evaluate their perceived performance, the workers must receive adequate feedback related to quantity, quality, and other aspects of job effectiveness as evinced from the survey instrument used. Thus, with sufficient on the job feedback, the worker may have a continuing source of information allowing him to improve performance as work continues. In addition, the feedback given to the worker may indicate that supervisors and others consider the work important and that good performance is strongly desired. Thus, one might expect the worker to strive for improved performance when experiencing higher levels of feedback. Alternatively, one might expect low levels of feedback to indicate that work performance is not of critical importance. If the worker perceives productivity as unimportant, it is likely that productivity will decrease.

A high level of feedback may also indicate that supervisors and others care about and are interested in the

workers' efforts. If this is perceived by a worker, he or she may feel more important to the organization and become more interested in the job, leading to increased satisfaction and involvement. The feeling that the worker knows whether he or she is performing the job well or not (Item 21) may well be important in determining the worker's affective responses to the job. This reasoning is consistent with job design theory as developed by previous researchers (Hackman & Oldham, 1975; Turner & Lawrence, 1965). In addition, if his or her efforts are perceived as unimportant, one would expect satisfaction and involvement to decline as well. The results of this study support this contention.

Variety and autonomy were significantly predictive only of the affective outcomes, satisfaction and involvement. Workers who perceive a high level of variety in their work appear to enjoy their jobs (satisfaction), while the variety of skills utilized tends to maintain their interest, prevent "wool-gathering," and thereby increase job involvement. This is to be expected, based on the item content of the survey instrument used in measuring skill variety. Responses that indicate low levels of variety on the job may be viewed as negative or belittling of the talents of the worker. For example, the worker would indicate that the job involved "doing the same routine things over and over again," "simple and repetitive activities," and a minimum of "complex or high-level skills." These perceptions on the part of the worker

are intuitively likely to be associated with lower self-esteem and negative feelings towards the job. Thus, one may expect lower levels of variety to be associated with reduced job satisfaction and involvement. Previous research (Hackman & Lawler, 1971; Hackman & Oldham, 1976) has supported the relationship between skill variety and positive affective outcomes. The necessity of using several skills on the job may increase the feelings of personal meaning of the work (Hackman & Oldham, 1976) which might be related to both job satisfaction and involvement experienced by the worker.

Autonomy in the job, by allowing the worker freedom to control his or her own procedures and efforts, appears to be related to satisfaction and involvement as well. Responses which indicate a low level of autonomy indicate that the worker has little freedom to make decisions or use personal initiative or judgment in accomplishing the work. The worker would be constrained in his actions and prevented from experiencing personal responsibility for work outcomes as theorized by Hackman and Oldham (1975) in the job characteristics model. However, in this study, while increasing variety and autonomy would appear to make the work more enjoyable and interesting, no significant relationship with performance was observed. This is consistent with the vast majority of existing research (Griffin et al., 1981). Thus, variety and autonomy may be used in job redesign to increase

the level of affective employee outcomes while using other methods (e.g., increasing feedback) to increase perceived performance.

Task significance was significantly predictive of satisfaction ($p < .01$). A job high in task significance is perceived as having an important impact on other people and as important in the broader scheme of things. Thus, one might expect a job with a great deal of significance, such as a paramedic's, to show a high degree of satisfaction with the job because the meaningfulness of the job is perceived as high (Hackman & Oldham, 1976). Task significance was not expected to be significantly predictive of job involvement as this outcome variable is primarily concerned with the self-image (Lodahl & Kejner, 1965) or the importance of the work to the worker as opposed to its effect on others.

In determining the unique contribution of each of the job characteristics in predicting the variance of the outcome variables, it was determined that task identity did not significantly predict any of the three for this research sample. The results of testing Hypotheses 2, 5, and 8 suggested that task identity was a superfluous measure in the full model for predicting perceived performance, satisfaction, and involvement. If work is perceived as one's life theme (job involvement), one might expect the worker to desire an "identifiable piece of work" that one could take pride in. This argument agrees with the Hackman and Oldham

(1975) contention that task identity increases experienced meaningfulness of the work, which they believe to be associated with positive employee outcomes.

The measure of *n* Ach was significantly predictive of perceived performance and involvement, but was not significantly related to satisfaction. The relationship of *n* Ach with performance has been noted to some degree by previous researchers (Steers & Braunstein, 1976; Steers & Spencer, 1977) although Evans et al. (1979) found no significant relationship. The results of the present study indicate a strong relationship between *n* Ach and performance. One characteristic of high-*n* Ach individuals is a desire to win and strive for success. They typically set goals which are challenging, yet achievable, and desire feedback concerning their performance. It is reasonable to assume that certain levels of successful performance could be established as a challenging and achievable goal. Thus, the high-*n* Ach individual might be expected to exhibit relatively high levels of performance. The results of this study tend to support this assertion.

The relationship between *n* Ach and affective outcomes, such as satisfaction and involvement, is not well established. Those studies (Evans et al., 1979; Rabinowitz et al., 1977; Stone et al., 1977) examining such relationships have not shown a significant effect. In considering the results of this study in conjunction with published research, one may conclude that *n* Ach is more closely related to perceived

performance than to affective outcomes. As pointed out by Rabinowitz et al. (1977), job involvement is considered a personal characteristic much as are individual differences variables. Thus, it is unlikely that a significant relationship exists between the two. The significant relationship observed in this study suggests that this relationship should be examined again with different research samples.

The measure of stress used in this study exhibited a strong relationship with job satisfaction ($p < .001$) which was expected and consistent with existing theory (Gupta & Beehr, 1979; Sarason & Johnson, 1979). One might expect that individuals experiencing negative stress and anxiety on the job would exhibit lower job satisfaction, as the results of this study indicate. Brief et al. (1981) point out that absenteeism and turnover, typical indicators of low job satisfaction, are often found to be related to negative stress. Thus, the results of this study tend to confirm the importance of stress in predicting job satisfaction.

Stress was not found to be significantly predictive for perceived performance or involvement in this study. Existing theory (Brief et al., 1981) indicated that stress should be negatively related to job performance and involvement. Experienced stress may distract the worker from work activities and, thus, may be expected to reduce efficiency. It would follow that job performance would suffer as a result. However, because each of the perceived performance measurement items

used in this survey evaluated performance as compared to other workers, the respondents may have consciously or unconsciously taken their individual feelings of stress into account when rating their performance. This could effectively remove the impact of stress from the worker's perception of performance. Some relationship might have been found if an objective performance measure, rather than a relatively weak perceptual measure, had been used in this study. The non-significant contribution of stress in predicting job involvement may be explained by the relatively stable nature of a worker's psychological identification with the work. Thus, one might not expect the measure of involvement to vary with different levels of external sources of stress, some of which are related to the work itself and others not.

Surprisingly, none of the interaction terms of n Ach with the other independent variables exhibited a significant effect for predicting perceived performance, satisfaction, or involvement. The results of this study suggest that interaction terms for n Ach and the other independent variables do not significantly contribute to prediction of the outcome variables examined. However, mixed results have been found by previous researchers (Evans et al., 1979; Steers & Braunstein, 1976; Steers & Spencer, 1977; Stone et al., 1977).

Future Directions

In general, this study has confirmed the predictive value of the core job characteristics for employee outcomes although task identity was not an important variable for this study. Thus, the results of this study show most importantly that only some of the job characteristics are related to the outcome variables of interest. This suggests that in future job design research the unique contribution of each job characteristic to the variance of employee outcome variables should be individually examined. It is important to recognize that possibly only certain independent variables are necessary in developing a full predictive model for employee outcomes and that those job characteristics not significantly contributing to prediction of such outcomes may be omitted from the model. In addition, stress was significant in predicting satisfaction, while n Ach was significant in predicting perceived performance and involvement. Thus, it is reasonable to continue using these independent variables in combination with task characteristics as a predictive model in job design research. This study also suggests various possible avenues of research concerning stress and n Ach.

The moderating effect of stress with regard to employee outcomes may provide interesting results in job design research. One might expect some effect of stress on perceived performance although a main effect was not exhibited

in this study. For instance, up to a certain point, one could expect increasing stress to improve perceived performance and past that point to impair perceived performance. Brief et al. (1981, p. 56) point out some instances in which performance, measured strictly by quantity, actually increases with stress although quality of work may decline. The effect of stress may only be evident in an interaction term. Due to individual differences, certain individuals may react to a "reasonable" amount of stress by increasing their effort and attention on job tasks, thereby improving performance. Other workers, however, may be found to react negatively to any sources of job stress and, thus, exhibit lower job performance than others under the same circumstances. This would imply at least a second order relationship which could be determined through the application of moderated regression.

The moderating effects of stress on the job characteristics/employee outcome relationships were examined using moderated regression, as an addition to the basic study. It was determined, however, that none of the interaction terms between stress and the job characteristics accounted for a significant increment in the variance of any of the three outcome variables in this sample.

The strong relationship between n Ach and perceived performance suggests that n Ach should continue to be included in examining perceived employee performance and objective

measures of performance. Griffin et al. (1981) noted the difficulty encountered by researchers in determining the relationships between job characteristics and employee outcomes, including several studies also examining moderator effects of other variables. No two of the 13 studies reviewed by Griffin et al. (1981) measured job performance in exactly the same way. The measurements ranged from self-ratings of the employees (as in this study) to objective measures of the number of units produced per hour. Only one of the studies reviewed (Orpen, 1979) used both a subjective (supervisory evaluation) and an objective (direct index of output) measure of job performance. No significant relationship between the job characteristics and performance was found. Griffin et al. (1981) concluded that performance measures used in previous job design research were "at best only moderately valid and meaningful and at worst potentially invalid and meaningless" (p. 662). Griffin et al. (1981) recommended greater emphasis on the explanation of the performance variable in terms of its components (quality, quantity, overall effectiveness, etc.). Following this, they recommend that meaningful empirical studies progress in three phases. The first phase should include controlled laboratory experiments to determine directions of causality. Then, cross-sectional field surveys should be conducted to validate the laboratory experiments. The third phase would "include

experimentation in the field to determine the practical and scientific significance of the task design construct in influencing employee performance" (p. 663).

In addition, further replication is required to determine if *n* Ach is actually related to affective outcomes, such as job involvement, as indicated by this study. Steers and Braunstein (1976) believed that a high-*n* Ach individual by nature will exhibit a large degree of job involvement. The desire to achieve success, which is a characteristic of such an individual, may tend to intensify his or her interest in the job. This tendency toward making the job a central life interest might tend to increase the amount of job involvement present.

The work of Umstot et al. (1976) concerning the application of both goal setting and job redesign to the work environment should be extended by including *n* Ach. In their study, goal setting was found to improve performance, while job redesign was found to improve satisfaction. One might expect individuals with high *n* Ach to improve performance even more markedly than those with low *n* Ach levels when goal setting is introduced. Results of this study, in conjunction with previous research (Steers & Braunstein, 1976), suggest that some effect should be observed on the job characteristics/affective outcomes, as well. A previous study by Steers (1975) investigated the moderating effect of *n* Ach on the relationship between task goal attributes and performance for first-

level supervisors working in a well-organized, goal-setting environment. The results of his study indicated that for high-n Ach supervisors (those scoring above the median in n Ach), feedback and goal specificity were significant ($p < .05$) factors in overall performance and goal achievement effort. However, low-n Ach supervisors (those scoring below the median in n Ach) showed no such relationship. The low-n Ach supervisors did demonstrate a significant ($p < .01$) relationship between participation in goal setting and overall performance, and between participation in goal setting and goal achievement effort at the .05 level. Investigation of the effects of job design and goal setting, both moderated by n Ach, may provide organizational researchers with a technique to improve both the behavioral and affective employee outcomes in the work place.

In the present study, the effect of n Ach (and stress) as a moderator variable was not significant for any of the job characteristics/employee outcome relationships examined, consistent with the research reviews presented by Griffin et al. (1981) and White (1978). However, while White advocates the complete elimination of moderator variables from job design research, Griffin et al. suggest that more emphasis on the proper measurement of variables could allow better understanding of moderator effects. We cannot accept White's contention that the moderating effect of individual differences variables is completely negligible. Intuitively, it seems

very plausible that individuals will react differently to job characteristics, other factors remaining constant. Thus, with regard to moderating variable research, one is left with improving the measurement of independent variables and constructing more accurate theoretical models for prediction. For instance, as suggested by Griffin et al. (1981), "hard" measures of behavioral outcomes may enable researchers to better determine the unconfounded effect of moderator variables in job design research.

In interpreting the results of this study, one must consider the limitations involved. Because of the cross-sectional nature of this research, no causal relationships may be inferred. Employee outcome variables were compared with existing job characteristics and no attempt was made to redesign jobs. As pointed out by White (1978), employees may exhibit quite different responses to actual manipulation of job characteristics than simply to characteristics of an existing job. This limits the generalization of findings to other job design research.

In addition, it must be considered that a relatively weak measure of perceived performance was used as one of the employee outcome variables. Griffin et al. (1981) pointed out that a weak measure of performance may severely limit the usefulness and generalization of job design research findings. Future researchers working in this area should focus more

effort in developing improved measures of job performance, perhaps incorporating both subjective measures (i.e., supervisory appraisals) and objective measures whenever feasible.

APPENDIX
AFIT SURVEY OF WORK ATTITUDES



AFIT SURVEY OF WORK ATTITUDES

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY (ATC)
AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

MCAP 10N 12-15
EXPIRES ON 31 DEC 83
117

PRIVACY ACT

In accordance with paragraph 30, AFR 12-35, the following information is provided as required by the Privacy Act of 1974:

a. Authority:

- (1) 5 U.S.C. 301, Departmental Regulations; and
- (2) 10 U.S.C. 8012, Secretary of the Air Force, Powers, Duties, Delegation by Compensation; and
- (3) EO 9397, 22 Nov 43, Numbering System for Federal Accounts Relating to Individual Persons; and
- (4) DOD Instruction 1100.13, 17 Apr 68, Surveys of Department of Defense Personnel; and
- (5) AFR 30-23, 22 Sep 76, Air Force Personnel Survey Program.

b. Principal purposes. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and DOD.

c. Routine uses. The survey data will be converted to information for use in research of management related problems. Results of the research, based on the data provided, will be included in a written master's thesis and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

GENERAL INFORMATION

The purpose of this questionnaire is to obtain information about you, your job, your work group and your organization. Specifically, this information is being collected in support of research assessing employee attitudes toward different aspects of their work environment.

Please be assured that all information you provide will be held in the strictest confidence. Your individual responses will NOT be provided to management or to any other agency. Feedback on the study's results will be presented to management only in terms of group averages describing what the "typical" employee would say. In addition, when the results of this study are published, readers will NOT be able to identify specific individuals or work groups.

A primary objective of this study is to track changes in worker attitudes over time. You will be asked to complete another survey at some later date. In order to detect any changes in worker attitudes, some means was needed to connect responses provided by an employee at different times. At the same time, the research team wishes to protect the anonymity of all participants. A procedure was developed to achieve both of these objectives. We ask your indulgence in complying with this procedure.

Questionnaire Tracking Procedure

On the computer scored response form you were provided you will find a five digit survey control number in the box labeled "identification number." Each employee has a different survey control number. An employee of the organization has agreed to serve as an intermediary in this procedure. When you complete your questionnaire this person will ask you for your survey control number and your social security number. That employee will retain this information on a master list. You will then turn your questionnaire in directly to a representative of the research team. This procedure will be followed for future administrations of the survey. The intermediary will have a key by which survey control numbers may be linked via social security numbers. He or she will not have access to any questionnaire responses. The research team will see completed questionnaires, but will only be told that one arbitrary survey control number should be paired with another. In this way, we feel we have provided for attainment of both aims of the study--employee anonymity and a means of tracking attitude changes.

Thank you for your cooperation in participating in this study. If you have any questions, please contact the researcher at the following address:

Major N. K. Ovalle, 2d, DBA
or
Robert P. Steel, PhD
Wright-Patterson AFB OH 45433
Telephone: AUTOVON 785-4435

KEYWORDS

The following are definitions of key words that recur throughout the questionnaire:

1. Supervisor: The person to whom you report directly.
2. Work Group: All persons who report to the same supervisor that you do. (If you are a supervisor, your work group is the group of employees that report directly to you).
3. Organization:

INSTRUCTIONS

This questionnaire contains 137 items (individual "questions"). The questionnaire booklet is broken into two parts. Part I contains the first 80 items in this booklet, and Part II contains the remaining 57 items. All items must be answered by filling in the appropriate spaces on the machine-scored response sheets provided. If for any item you do not find a response that fits your situation exactly, use the one that is the closest to the way you feel.

Please use a "soft-lead" (No. 2) pencil, and observe the following:

1. Make heavy black marks that fill in the space (of the response you select).
2. Erase cleanly any responses you wish to change.
3. Make no stray markings of any kind on the response sheet.
4. Do not staple, fold or tear the response sheet.
5. Do not make any markings on the questionnaire booklet.

You have been provided with two answer sheets. Do NOT fill in your name on either sheet so that your responses will be anonymous. Please note that both sheets have a survey control number ending with either "1" or "2." Please use the answer sheet with the survey control number ending with the number "1" to respond to the 80 items in Part I of the survey. Answer the items in Part II (numbered from 1 to 57) on the answer sheet with the survey control number ending in "2."

Each response block has 10 spaces (numbered 1 through 10) or a 1-10 scale. The questionnaire items normally require a response from 1-7 only, therefore, you will rarely need to fill in a space numbered 8, 9, or 10. Questionnaire items are responded to by marking the appropriate space on the answer sheet as in the following example:

SCALE:

- | | |
|--------------------------------|----------------------|
| 1 = Strongly disagree | 5 = Slightly agree |
| 2 = Moderately disagree | 6 = Moderately agree |
| 3 = Slightly disagree | 7 = Strongly agree |
| 4 = Neither agree nor disagree | |

Sample item 1:

The guidance you receive in your job from your supervisor is frequently unclear.

(If you "moderately agree" with sample item #1, you would "blacken in" the corresponding number of that statement (moderately agree = 6) on the answer sheet for item numbered "sample item 1.")

Sample response: 1 2 3 4 5 6 7 8 9 10
 ☐ ☐ ☐ ☐ ☐ ☒ ☐ ☐ ☐ ☐

PART I

BACKGROUND INFORMATION

This section of the survey contains several items dealing with personal characteristics. This information will be used to obtain a picture of the background of the "typical employee."

1. Your age is:

1. Less than 20
2. 20 to 25
3. 26 to 30
4. 31 to 40
5. 41 to 50
6. 51 to 60
7. More than 60

2. Your highest educational level obtained was:

1. Non high school graduate
2. High school graduate or GED
3. Some college work
4. Associate degree or LPN
5. Bachelor's degree or RN
6. Some graduate work
7. Master's degree
8. Doctoral degree

3. Your sex is:

1. Male
2. Female

4. Total months in this organization is:

1. Less than 1 month
2. More than 1 month, less than 6 months
3. More than 6 months, less than 12 months
4. More than 12 months, less than 18 months
5. More than 18 months, less than 24 months
6. More than 24 months, less than 36 months
7. More than 36 months.

5. How many people do you directly supervise (i.e., those for which you write performance reports)?

1. None
2. 1 to 2
3. 3 to 5
4. 6 to 8
5. 9 to 12
6. 13 to 20
7. 21 or more

6. You are a (an):

1. Officer
2. Enlisted
3. Civilian (GS)
4. Civilian (WG)
5. Non-appropriated Fund (NAF employee)
6. Other

7. Your grade level is:

1. 1-2
2. 3-4
3. 5-6
4. 7-8
5. 9-10
6. 11-12
7. 13-15
8. Senior Executive Service

JOB SATISFACTION

Below are 5 items which relate to the degree to which you are satisfied with various aspects of your job. Read each item carefully and choose the statement below which best represents your opinion.

- 1 = Delighted
- 2 = Pleased
- 3 = Mostly satisfied
- 4 = Mixed (about equally satisfied and dissatisfied)
- 5 = Mostly dissatisfied
- 6 = Unhappy
- 7 = Terrible

- 8. How do you feel about your job?
- 9. How do you feel about the people you work with--your co-workers?
- 10. How do you feel about the work you do on your job--the work itself?
- 11. What is it like where you work--the physical surroundings, the hours, the amount of work you are asked to do?
- 12. How do you feel about what you have available for doing your job--I mean equipment, information, good supervision, and so on?

SUPERVISOR'S ASSESSMENT OF YOUR PERFORMANCE

The following statements deal with feedback you receive from your supervisor concerning your performance. Your frame of reference should be your supervisor's evaluation of your performance in terms of formal feedback (i.e., periodic, written performance appraisals) and informal feedback (i.e., verbal communication on a day-to-day basis). Please think carefully about his/her evaluations of you over the past six months or so.

Based upon the feedback you have received from your supervisor, use the rating scale below to indicate how your job performance would compare with other employees doing similar work.

- 1 = Far worse
- 2 = Much worse
- 3 = Slightly worse
- 4 = About average
- 5 = Slightly better
- 6 = Much better
- 7 = Far better

- 13. Compared with other employees doing similar work, your supervisor considers the quantity of the work you produce to be:
- 14. Compared with other employees doing similar work, your supervisor considers the quality of the work you produce to be:
- 15. Compared with other employees performing similar work, your supervisor believes the efficiency of your use of available resources (money, materials, personnel) in producing a work product is:
- 16. Compared with other employees performing similar work, your supervisor considers your ability in anticipating problems and either preventing or minimizing their effects to be:
- 17. Compared with other employees performing similar work, your supervisor believes your adaptability/flexibility in handling high-priority work (e.g., "crash projects" and sudden schedule changes) is:

JOB EFFORT RATING

18. As fairly and objectively as you can, rate the typical amount of effort you normally put into doing your work.

- 1 = Very little effort
- 2 = Enough effort to get by
- 3 = Moderate effort
- 4 = More effort than most
- 5 = Very much effort

FUTURE WORK PLANS

Use the rating scale given below to indicate your future work plans with respect to the Air Force or whatever equivalent service/company to which you belong.

19. Within the coming year, if I have my own way:

- 1 = I definitely intend to remain with the Air Force.
- 2 = I probably will remain with the Air Force.
- 3 = I have not decided whether I will remain with the Air Force.
- 4 = I probably will not remain with the Air Force.
- 5 = I definitely intend to separate from the Air Force.

ORGANIZATIONAL INFORMATION

Listed below are a series of statements that represent possible feelings that individuals might have about the company or organization for which they work. Use the following rating scale to indicate your own feelings about the particular organization for which you are now working.

- 1 = Means you strongly disagree with the statement.
- 2 = Means you moderately disagree with the statement.
- 3 = Means you slightly disagree with the statement.
- 4 = Means you neither agree nor disagree with the statement.
- 5 = Means you slightly agree with the statement.
- 6 = Means you moderately agree with the statement.
- 7 = Means you strongly agree with the statement.

20. I am willing to put in a great deal of effort beyond that normally expected in order to help this organization be successful.

- 1 = Means you strongly disagree with the statement.
- 2 = Means you moderately disagree with the statement.
- 3 = Means you slightly disagree with the statement.
- 4 = Means you neither agree nor disagree with the statement.
- 5 = Means you slightly agree with the statement.
- 6 = Means you moderately agree with the statement.
- 7 = Means you strongly agree with the statement.

- 21. I talk up this organization to my friends as a great organization to work for.
- 22. I feel very little loyalty to this organization.
- 23. I would accept almost any type job assignment in order to keep working for this organization.
- 24. I find that my values and the organization's values are very similar.
- 25. I am proud to tell others that I am part of this organization.
- 26. I could just as well be working for a different organization as long as the type of work was similar.
- 27. This organization really inspires the very best in me in the way of job performance.
- 28. It would take very little change in my present circumstances to cause me to leave this organization.
- 29. I am extremely glad that I chose this organization to work for over others I was considering at the time I joined.
- 30. There's not too much to be gained by sticking with this organization indefinitely.
- 31. Often, I find it difficult to agree with this organization's policies on important matters relating to its employees.
- 32. I really care about the fate of this organization.
- 33. For me this is the best of all possible organizations for which to work.
- 34. Deciding to work for this organization was a definite mistake on my part.

JOB INFORMATION

Use the following rating scale for the 15 statements to express your own feelings about your present job or work.

1. Means you strongly disagree with the statement
 2. Means you moderately disagree with the statement
 3. Means you slightly disagree with the statement
 4. Means you neither disagree nor agree with the statement.
 5. Means you slightly agree with the statement.
 6. Means you moderately agree with the statement.
 7. Means you strongly agree with the statement.
-
35. I often have to use the skills I have learned for my job.
 36. I often have a chance to try out my own ideas.
 37. I often have a chance to do things my own way.
 38. I often have a chance to do the kinds of things that I am best at.
 39. I often feel at the end of the day that I've accomplished something.
 40. The most important things that happen to me involve my work.
 41. The most important things I do involve my work.
 42. The major satisfaction in my life comes from my job.
 43. The activities which give me the greatest pleasure and personal satisfaction involve my job.
 44. I live, eat, and breathe my job.
 45. I would rather get a job promotion than be a more important member of my club, church, or lodge.
 46. How well I perform on my job is extremely important to me.
 47. I feel badly if I don't perform well on my job.
 48. I am very personally involved in my work.
 49. I avoid taking on extra duties and responsibilities.

WORK ROLE ATTITUDES

This section of the questionnaire contains a number of statements that relate to feelings about your work group, the demands of your job, and the supervision you receive. Use the following rating scale to indicate the extent to which you agree or disagree with the statements shown below.

- 1 = Strongly disagree
- 2 = Moderately disagree
- 3 = Slightly disagree
- 4 = Neither agree nor disagree
- 5 = Slightly agree
- 6 = Moderately agree
- 7 = Strongly agree

- 50. Within my work-group the people most affected by decisions frequently participate in making the decisions.
- 51. In my work-group there is a great deal of opportunity to be involved in resolving problems which affect the group.
- 52. I am allowed to participate in decisions regarding my job.
- 53. I am allowed a significant degree of influence in decisions regarding my work.
- 54. My supervisor usually asks for my opinions and thoughts in decisions affecting my work.
- 55. My job (e.g., the type of work, amount of responsibility, etc.) causes me a great deal of personal stress and anxiety.
- 56. Relations with the people I work with (e.g., co-workers, supervisor, subordinates) cause me a great deal of stress and anxiety.
- 57. General aspects of the organization I work for (e.g., policies and procedures, general working conditions) tend to cause me a great deal of stress and anxiety.
- 58. Most people are not always straightforward and honest when their own interests are involved.
- 59. In these competitive times one has to be alert or someone is likely to take advantage of you.
- 60. It is safe to believe that in spite of what people say, most people are primarily interested in their own welfare.
- 61. There is a high spirit of teamwork among my co-workers.
- 62. Members of my work group take a personal interest in one another.

63. If I had a chance to do the same kind of work for the same pay in another work group, I would still stay here in this work group.
64. My immediate supervisor makes an effort to help people in the work group with their personal problems.
65. My immediate supervisor insists that members of our work group follow to the letter all policies and procedures handed down to him.
66. My immediate supervisor seeks the advice of our work group on important matters before going ahead.
67. My immediate supervisor pushes the people under him (or her) to insure they are working up to capacity.
68. My organization provides all the necessary information for me to do my job effectively.
69. My work group is usually aware of important events and situations.
70. The people I work with make my job easier by sharing their ideas and opinions with me.
71. People in my work group are never afraid to speak their minds about issues and problems that affect them.

WORK GOALS

The following statements deal with your perceptions of the nature of goals and objectives that guide your work. Use the rating scale given below to indicate the extent to which your work goals have the characteristics described.

- 1 = Strongly disagree
- 2 = Moderately disagree
- 3 = Slightly disagree
- 4 = Neither agree nor disagree
- 5 = Slightly agree
- 6 = Moderately agree
- 7 = Strongly agree

- 72. I know exactly what is expected of me in performing my job.
- 73. I understand clearly what my supervisor expects me to accomplish on the job.
- 74. What I am expected to do at work is clear and unambiguous.
- 75. I understand the priorities associated with what I am expected to accomplish on the job.
- 76. It takes a high degree of skill on my part to attain the results expected for my work.
- 77. Results expected in my job are very difficult to achieve.
- 78. It takes a lot of effort on my part to attain the results expected for my work.
- 79. I must work hard to accomplish what is expected of me for my work.
- 80. I must exert a significant amount of effort to attain the results expected of me in my job.

Your first answer sheet should now be completely filled. If it is not completely filled, go back and check the sequencing of your answers. You may have skipped an item. Use the second answer sheet (the survey control number ends in "2") to respond to the remaining items in the questionnaire (those in Part II).

PART II

WORK GOALS (continued)

1. Means you strongly disagree with the statement
 2. Means you moderately disagree with the statement
 3. Means you slightly disagree with the statement
 4. Means you neither disagree nor agree with the statement.
 5. Means you slightly agree with the statement.
 6. Means you moderately agree with the statement.
 7. Means you strongly agree with the statement.
-
1. The amount of work I am expected to accomplish on the job is realistic.
 2. The results I am expected to attain in my work are realistic.
 3. What my supervisor expects me to accomplish on my job is not impossible.
 4. I find that the results that I am expected to attain in my work are achievable.

JOB CHARACTERISTICS

This part of the questionnaire asks you to describe your job, as objectively as you can.

Please do NOT use this part of the questionnaire to show how much you like or dislike your job. Questions about that will come later. Instead, try to make your descriptions as accurate and as objective as you possibly can.

A sample question is given below:

- A. To what extent does your job require you to work with mechanical equipment?

1-----	2-----	3-----	4-----	5-----	6-----	7-----
Very little; the job		Moderately				Very much; the
requires almost						job requires
no contact with						almost constant
mechanical						work with
equipment of						mechanical
any kind.						equipment.

Indicate on the answer sheet the number which is the most accurate description of your job. If, for example, your job requires you to work with mechanical equipment a good deal of the time, but also requires some paperwork, you might choose the number six, so you would blacken "6" in on the answered sheet.

If you do not understand these instructions, please ask for assistance. If you do understand them, turn the page and begin.

PLACE ALL ANSWERS ON ANSWER SHEET!

5. How much autonomy is there in your job? That is, to what extent does your job permit you to decide on your own how to go about doing the work?

1-----2-----3-----4-----5-----6-----7

Very little; the job gives me almost no personal "say" about how and when the work is done.

Moderate autonomy; many things are standardized and not under my control, but I can make some decisions about the work.

Very much; the job gives almost complete responsibility for deciding how and when the work is done.

6. To what extent does your job involve doing a "whole" and identifiable piece of work? That is, is the job a complete piece of work that has an obvious beginning and end? Or is it only a small part of the overall piece of work, which is finished by other people or by automatic machines?

1-----2-----3-----4-----5-----6-----7

My job is only a tiny part of the overall piece of work; the results of my activities cannot be seen in the final product or service.

My job is a moderate-sized "chunk" of the overall piece of work; my own contribution can be seen in the final outcome.

My job involves doing the whole piece of work; from start to finish; the results of my activities are easily seen in the final product or service.

7. How much variety is there in your job? That is, to what extent does the job require you to do many different things at work, using a variety of your skills and talents?

1-----2-----3-----4-----5-----6-----7

Very little; the job requires me to do the same routine things over and over again.

Moderate variety.

Very much; the job requires me to do many different things, using a number of different skills and talents.

8. In general, how significant or important is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people?

1-----2-----3-----4-----5-----6-----7

Not very significant; the outcomes of my work are not likely to have important effects on other people

Moderately significant.

Highly significant; the outcomes of my work can affect other people in very important ways.

Section Two

Listed below are a number of statements which could be used to describe a job. You are to indicate whether each statement is an accurate or an inaccurate description of your job. Once again, please try to be as objective as you can in deciding how accurately each statement describes your job--regardless of whether you like or dislike your job.

How accurate is the statement in describing your job?

1	2	3	4	5	6	7
Very	Mostly	Slightly	Uncertain	Slightly	Mostly	Very
Inaccurate	Inaccurate	Inaccurate		Accurate	Accurate	Accurate

9. The job requires me to use a number of complex or high-level skills.
10. The job is arranged so that I do not have the chance to do an entire piece of work from beginning to end.
11. The job is quite simple and repetitive.
12. This job is one where a lot of other people can be affected by how well the work gets done.
13. The job denies me any chance to use my personal initiative or judgment in carrying out the work.
14. The job provides me the chance to completely finish the pieces of work I begin.
15. The job gives me considerable opportunity for independence and freedom in how I do the work.
16. The job itself is not very significant or important in the broader scheme of things.

JOB FEEDBACK

Use the rating scale below to indicate how you feel about the following two questions.

- 1 = Very little
- 2 = Little
- 3 = A moderate amount
- 4 = Much
- 5 = Very much

- 17. To what extent do you find out how well you are doing on the job as you are working?
- 18. To what extent do you receive information from your superior on your job performance.

Use the same rating scale to indicate how much job feedback is present in your job.

- 19. The feedback from my supervisor on how well I am doing.
- 20. The opportunity to find out how well I am doing in my job.
- 21. The feeling that I know whether I am performing my job well or poorly.

TASK PREFERENCES

Below are listed ten statements that describe various things people do or try to do on their jobs. We would like to know which of the statements you feel most accurately describe your own behavior when you are at work. Please use the following scale to indicate the word (or phrase) which best describes your own actions. Remember, there are no right or wrong answers. Please answer all questions frankly.

- 1 = Never
- 2 = Almost never
- 3 = Seldom
- 4 = Sometimes
- 5 = Usually
- 6 = Almost always
- 7 = Always

- 22. I do my best work when my job assignments are fairly difficult.
- 23. I try very hard to improve on my past performance at work.
- 24. I take moderate risks and stick my neck out to get ahead at work.
- 25. I try to avoid any added responsibilities on my job.

26. I try to perform better than my co-workers.
27. When I have a choice, I try to work in a group instead of by myself.
28. I pay a good deal of attention to the feelings of others at work.
29. I prefer to do my own work and let others do theirs.
30. I express my disagreements with others openly.
31. I find myself talking to others around me about non-business related matters.

TASK DEMANDS

This section of the questionnaire contains a number of statements about your job. Use the following rating scale to indicate the extent to which you agree or disagree with the statements shown below.

- 1 = Strongly disagree
- 2 = Moderately disagree
- 3 = Slightly disagree
- 4 = Neither agree nor disagree
- 5 = Slightly agree
- 6 = Moderately agree
- 7 = Strongly agree

- 32. The job offers me a chance to test myself and my abilities.
- 33. Doing this job well is a reward in itself.
- 34. If the work were only more interesting I would be motivated to perform better.
- 35. Mastering the job meant a lot to me.
- 36. My talents, or where I can concentrate my attention best, are found in areas not related to this job.
- 37. This job is valuable to me for no other reason than I like to do it.
- 38. At times I can get so involved in my work that I forget what time it is.
- 39. Even though the work here could be rewarding, I am frustrated and find motivation continuing only because of my paycheck.
- 40. I honestly believe I have all the skills necessary to perform this task well.
- 41. I would make a fine model for an apprentice to follow in order to learn the skills he/she would need to succeed.
- 42. No one knows this job better than I do.
- 43. If anyone here can find the answer, I'm the one.
- 44. I do not know as much as my predecessor did concerning this job.

SITUATIONAL ATTRIBUTES

These items deal with various attributes and characteristics of your job situation.

- 1 = Strongly disagree
- 2 = Moderately disagree
- 3 = Slightly disagree
- 4 = Neither agree nor disagree
- 5 = Slightly agree
- 6 = Moderately agree
- 7 = Strongly agree

- 45. My supervisor knows his/her workers very well; that is, he/she can pinpoint personalities and thereby decides who works well with whom.
- 46. There is a great deal of support and unselfishness in our work group.
- 47. Members of our work group are treated equally in terms of their worth to the workgroup.

GOAL AGREEMENT

- 1 = Not at all
- 2 = To a very little extent
- 3 = To a little extent
- 4 = To a moderate extent
- 5 = To a fairly large extent
- 6 = To a great extent
- 7 = To a very great extent

- 48. To what extent are your organization's goals compatible with your own personal goals?

SELF PERCEIVED ABILITY

- 1 = Much less ability than others
- 2 = Less ability than others
- 3 = Typical or average ability
- 4 = More ability than others
- 5 = Much more ability than others

- 49. Compared to others whose job is similar to yours how would you rate your ability to perform the work?

ORGANIZATIONAL PERCEPTIONS

Some organizations go out of their way to take care of their employees. They have a genuine interest in the welfare of their workers. They have many ways of communicating to their workers that they are valued and respected. Other organizations have developed a reputation among their workforce as uncaring impersonal creations. These organizations often treat their employees in a dehumanized fashion -- as if the workers were little more than cogs in a well-oiled machine.

Most organizations fall somewhere between those two extremes. Use the bipolar rating scales given below to indicate the degree to which you have seen your organization demonstrate a concern for the welfare of its employees.

For example: If your organization appeared "flexible" most of the time when dealing with its employees, you might rate it as shown.

Rigid--1--2--3--4--5--6--7--Flexible

50. Unconcerned--1--2--3--4--5--6--7--Concerned

51. Impersonal--1--2--3--4--5--6--7--Humane

52. Uncaring--1--2--3--4--5--6--7--Caring

53. Disinterested--1--2--3--4--5--6--7--Interested

54. Aloof--1--2--3--4--5--6--7--Friendly

The remaining three items are used for administrative purposes. They indicate the type of survey (first, second, etc.) and the sponsoring organization involved.

55. Please fill in response choice Number "1" for this item.

56. Please fill in response choice Number "1" for this item.

57. Please fill in response choice Number " " for this item.

THANK YOU FOR YOUR COOPERATION

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BIOGRAPHICAL SKETCHES OF THE AUTHORS

Captain Michael K. Deacy was born and raised in New York City, New York. He earned a Bachelor's degree in Natural Sciences from the University of Rochester in Rochester, New York and was commissioned in 1977 at the Air Force Officers' Training School, Lackland AFB, Texas. After graduating from the Communications-Electronics Officer Technical Training School at Keesler AFB, Mississippi, he served as Maintenance Officer at Detachment 6, First Combat Evaluation Group (SAC), Bayshore Radar Station, Michigan. In October 1980, Captain Deacy became the Wire Branch Chief for the 1835th Electronics Installation Squadron, Norton AFB, California. In June 1982, he entered the Master's Degree Program in Graduate Logistics Management at AFIT. After graduation he will be assigned to the Programs Division at the Engineering Installation Center, Oklahoma City AFS, Oklahoma.

Captain Hal E. Marsh was born and raised in upstate New York. After receiving a Bachelor of Science degree in Education from Rocky Mountain College in Billings, Montana, he enlisted in the Air Force. Captain Marsh was commissioned through the Officers' Training School in 1974 where he was reassigned to Communications-Electronics Technical Training School at Keesler AFB, Mississippi. From Keesler AFB, he was assigned to the 485th Electronics Installation Squadron and served as Chief, Workload Control Branch and, later, Chief, Wire Branch. In December 1978, Captain Marsh was reassigned to the 2004th Communications Squadron in Sondrestrom AB, Greenland and served as Chief Contract Monitor for communications. In January 1980, he served as the Operational Test and Evaluation Project Manager for the TRI-TAC and SEEK TALK programs at the USAF Tactical Air Warfare Center (TAC) at Eglin AFB, Florida. Two weeks prior to reporting to AFIT, Captain Marsh was married to the former Wendy Savage of Fort Walton Beach, Florida. Following AFIT, he will be assigned to the Directorate of Requirements, Headquarters Tactical Air Command, Langley AFB, Virginia.

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